Science WONDER Quarterly

FALL 1929

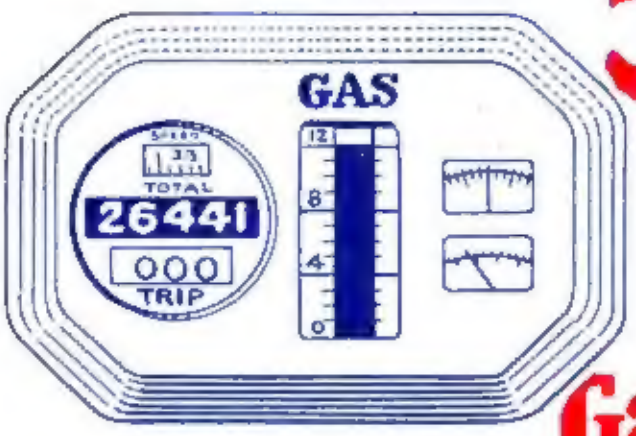
HUGO GERNSBACK
Editor

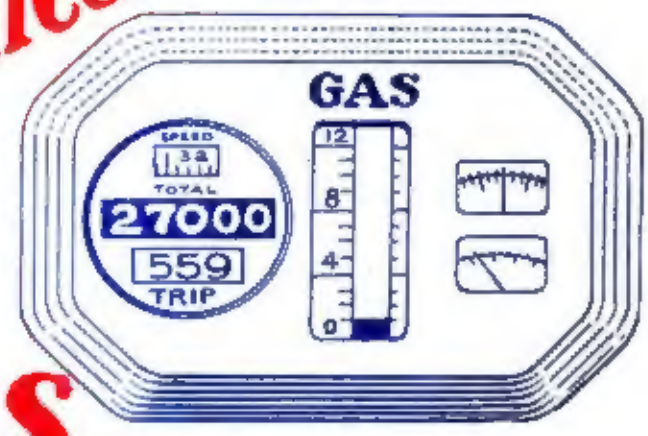
A GERNSBACK PUBLICATION

50 CENTS
IN CANADA

Over the Mountains from Los Angeles

559 Miles on 11 Gallons of GAS





Think of it! FIVE HUNDRED FIFTY-NINE MILES over rough mountainous country burning only ELEVEN GALLONS OF GASOLINE. Imagine more than FIFTY MILES to the GALLON. This is what the WHIRLWIND CARBURETING DEVICE does for D. R. Gilbert, enough of a saving on just one trip to more than pay the cost of the Whirlwind.

THE WHIRLWIND SAVES MOTORISTS MILLIONS OF DOLLARS YEARLY

Whirlwind users, reporting the results of their tests, are amazed at the results they are getting. Letters keep streaming into the office telling of mileages all the way from 22 to 59 miles on a gallon, resulting in a saving of from 25 to 50% in gas bills alone.

Mark H. Estes writes: "I was making 17 miles to the gallon on my Pontiac Coupe. Today, with the Whirlwind, I am making 35 5/10 miles to the gallon. Am I glad I put it on? I'll say so!"

P. P. Goerzen writes: "I made an actual test both with and without a Whirlwind, getting 13½ miles without and 36 4/10 miles with the Whirlwind, or a gain of 21 miles to the gallon. The longer the Whirlwind is in use on the machine, the better the engine runs, has more pep and quicker starting. It makes a new engine out of an old one, and starts at the touch of the starter button."

R. J. Tulp: "The Whirlwind increased the mileage on our Ford truck from 12 to 26 miles to gallon and 25% in speed. We placed another on a Willy's Knight, and increased from 12 to 17 miles per gallon.

Arthur Grant: "I have an Oakland touring car that has been giving me 15 miles to the gallon average, but I can see a great difference with the Whirlwind, as it climbs the big hills on high and gives me better than 23 miles to the gallon of gas, which is better than 50% saving in gas."

W. A. Scott: "I had my Whirlwind for three years. Winter and summer it gives the same perfect service, instant starting, smoother running, and what I saved in gasoline these last few years has brought other luxuries which I could not have afforded previously."

Car owners all over the world are saving money every day with the Whirlwind, besides having better operating motors. Think what this means on your own. Figure up your savings—enough for a radio—a bank account—added pleasure. Why let the Oil Companies profit by your waste. Find out about this amazing little device that will pay for itself every few weeks in gas saving alone.

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In just a few minutes the Whirlwind can be installed on any make of car, truck or tractor. It's actually less work than changing your oil, or putting water in the battery. No drilling, tapping or changes of any kind necessary. It is guaranteed to work perfectly on any make of car, truck or tractor, large or small, new model or old model. The more you drive the more you will save.

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Free Sample and $100.00 a Week Offer

Whirlwind men are making big profits supplying this fast-selling device that car owners cannot afford to be without. Good territory is still open. Free sample offer and full particulars sent on request. Just check the coupon.

WHIRLWIND MANUFACTURING CO.
999-51-E Third Street Milwaukee, Wisc.

GUARANTEE

No matter what kind of a car you have—no matter how big a gas eater it is—the Whirlwind will save you money. We absolutely guarantee that the Whirlwind will more than save its cost in gasoline alone within thirty days, or the trial will cost you nothing. We invite you to test it at our risk and expense. You are to be the sole judge.

FREE TRIAL COUPON

WHIRLWIND MANUFACTURING CO.
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Gentlemen: You may send me full particulars of your Whirlwind Carbureting device and free trial offer. This does not obligate me in any way whatever.

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Address .....

City .....

County ..... State.....

☐ Check here if you are interested in full or part time salesmen position.

Amazingly Easy Way to get into ELECTRICITY

Don't spend your life waiting for $5 raises in a dull, hopeless job. Now . . . and forever . . . say good-bye to 25 and 35 dollars a week. Let me show you how to qualify for jobs leading to salaries of $50, $60 and up, a week, in Electricity—NOT by correspondence, but by an amazing way to teach, that makes you an electrical expert in 90 days! Getting into Electricity is far easier than you imagine!

Learn Without Lessons in 90 DAYS

Lack of experience—age, or advanced education bars no one. I don't care if you don't know an armature from an air brake—I don't expect you to! I don't care if you're 16 years old or 48—it makes no difference! Don't let lack of money stop you. Most of the men at Coyne have no more money than you have.

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I will allow your railroad fare to Chicago, and if you should need part-time work I'll assist you to it. Then, in 12 brief weeks, in the great roaring shops of Coyne, I train you as you never dreamed you could be trained . . . on the greatest outlay of electrical apparatus ever assembled in any electrical school . . . costing hundreds of thousands of dollars . . . real dynamos, engines, power plants, autos, switchboards, transmitting stations . . . everything from doorbells to farm power and lighting . . . full-sized . . . in full operation every day!

No Books-No Printed Lessons

No books, no baffling charts . . . all real actual work . . . right here in the great Coyne school . . . building real batteries . . . winding real armatures, operating real motors, dynamos and generators, wiring houses, etc., etc. That's a glimpse of how we make you a master practical electrician in 90 days, teaching you far more than the average ordinary electrician ever knows and fitting you to step into jobs leading to big pay immediately after graduation. Here, in this world-famous *Parent school*—and nowhere else in the world—can you get such training!

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Here are a few of hundreds of positions open to Coyne-trained men. Our free employment bureau gives you lifetime employment service.

Armature Expert, to $100 a Wk.
Substation Operator $60 a Week and up
Auto Electrician $110 a Week
Inventor . . . . . Unlimited
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Jobs-Pay-Future

Dont' worry about a job, Coyne training settles the job question for life. Demand for Coyne men often exceeds the supply. Our employment bureau gives you a lifetime service. Two weeks after graduation, Clyde F. Hart got a position as electrician for the Great Western Railroad at over $100 a week. That's not unusual. We can point to Coyne men making up to $600 a month. $60 a week is only the beginning of your opportunity. You can go into radio, battery, or automotive electrical business for yourself and make up to $15,000 a year.

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Coyne is your one great chance to get into electricity. Every obstacle is removed. This school is 30 years old—Coyne training is tested—proven beyond all doubt—endorsed by many large electrical concerns. You can find out everything absolutely free. Simply mail the coupon and let me send you the big, free Coyne book of 150 photographs . . . facts . . . jobs . . . salaries . . . opportunities. Tells you how many earn expenses while training and how we assist our graduates in the field. This does not obligate you. So act at once. Just mail coupon.

Now in Our New Home

This is our new, fireproof, modern home wherein is installed thousands of dollars' worth of the newest and most modern Electrical Equipment of all kinds. We now have the largest amount of floor space devoted to the exclusive teaching of practical electricity in the world. Every comfort and convenience has been arranged to make you happy and contented during your training.

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Without obligation send me your big free catalog and all details of Railroad Fare to Chicago, Free Employment Service, Radio, Aviation Electricity, and Automotive Courses, and how I can "earn while learning."

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City..... State.....

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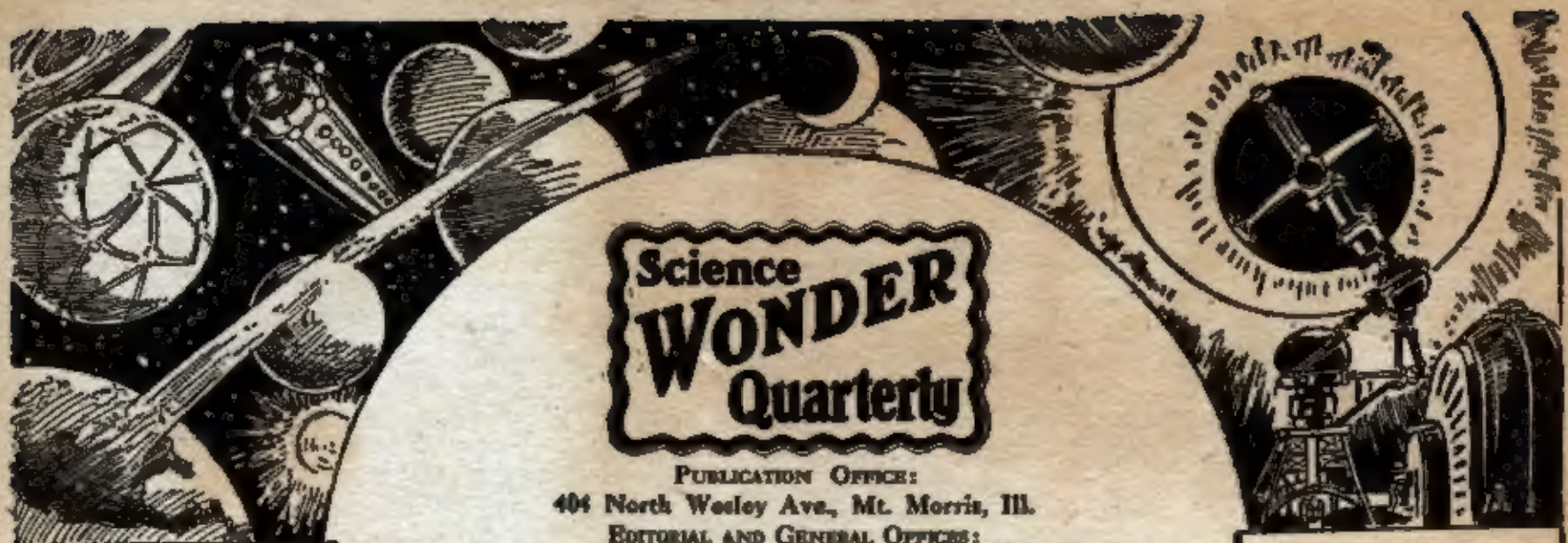

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1929

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OUR COVER ILLUSTRATION

Depicts an exciting episode from Otto Willi Gail's novel "The Shot Into Infinity."

Here we see the spaceship *Geryon* plunging towards the moon. The moon may be observed at the right-hand side, still a great distance away.

In the position shown, the spaceship is rushing ahead at a tremendous speed, yet it is possible for the adventurers to venture outside the spaceship in airtight and cold-insulated space-suits. The men are connected to the spaceship by lengths of thin telephone wires, by means of which they can converse with each other. Inasmuch as they are in the so-called "free-fall," there is no strain on the light telephone wires, which they also use to pull themselves back to the ship. They may also return to the ship by firing pistols, as is also shown, in the opposite direction to which they wish to travel.

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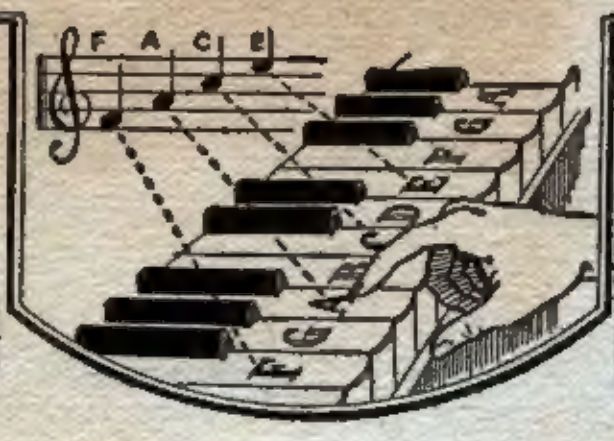
Half a Million People

have learned music this easy way



You, Too, Can Learn to Play Your Favorite Instrument Without a Teacher

Easy as A-B-C

YES, half a million delighted men and women all over the world have learned music this quick, easy way.

Half a million—500,000—what a gigantic orchestra they would make! Some are playing on the stage, others in orchestras, and many thousands are daily enjoying the pleasure and popularity of being able to play some instrument.

Surely this is convincing proof of the success of the *new, modern method* perfected by the U. S. School of Music! And what these people have done, YOU, too, can do!

Many of this half million didn't know one note from another—others had never touched an instrument—yet in half the usual time they learned to play their favorite instrument. Best of all, they found learning music *amazingly easy.* No monotonous hours of exercises—no tedious scales—no expensive teachers. This simplified method made learning music as easy as A-B-C!

It is like a fascinating game. From the very start you are playing *real* tunes perfectly by *note.* You simply can't go wrong, for every step, from beginning to end, is right before your eyes in print and picture. First you are *told* how to do a thing, then a picture *shows* you how, then you do it yourself and *hear* it. And almost before you know it you are playing your favorite pieces—jazz, ballads, classics. No private teacher could make it clearer. Little theory—plenty of accomplishment. That's why students of the U. S. School of Music get ahead *twice as fast—three times as fast* as those who study old-fashioned, plodding methods.

What Instrument for You?

Piano	Guitar
Organ	Piccolo
Violin	Hawaiian
Banjo (Plectrum, 5-String or Tenor)	Steel Guitar
Clarinet	Drums and Traps
Flute	Mandolin
Harp	Sight Singing
Cornet	Ukulele
'Cello	Saxophone

Voice and Speech Culture
Automatic Finger Control
Piano Accordion
Italian and German Accordion

You don't need any special "talent." Many of the half million who have already become accomplished players never dreamed they possessed musical ability. They only wanted to play some instrument—just like you—and they found they could quickly learn how this easy way. Just a little of your spare time each day is needed—and you enjoy every minute of it. The cost is surprisingly low—averaging only a few cents a day—and the price is the same for whatever instrument you choose. And remember you are studying right in your own home—without paying big fees to private teachers.

Don't miss any more good times! Learn how to play your favorite instrument and surprise all your friends. Change from a wallflower to the center of attraction. Music is the best thing to offer at a party—musicians are invited everywhere. Enjoy the popularity you have been missing. Get your share of the musician's pleasure and profit! Start now!

Free Booklet and Demonstration Lesson

If you are in earnest about wanting to join the crowd of entertainers and be a "big hit" at any party—if you really *do* want to play your favorite instrument, to become a performer whose services will be in demand—fill out and mail the convenient coupon asking for our Free Booklet and Free Demonstration Lesson. These explain our wonderful method fully and show you how easily and quickly you can learn to play at little expense. The booklet will also tell you all about the amazing new *Automatic Finger Control.* Instruments are supplied when needed—cash or credit. U. S. School of Music, 403-H Brunswick Bldg., New York City.

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403-H Brunswick Bldg., New York City.

Please send me your free book, "Music Lessons in Your Own Home," with introduction by Dr. Frank Crane, Free Demonstration Lesson, and particulars of your easy payment plan. I am interested in the following course:

.....

Have you above instrument? .....

Name .....
(Please Write Plainly)

Address .....

City .....State .....

$350 a month

"I feel proud of my success in Radio to date. My profit during the last two months amounts to $700. I am making good and I have not finished my N. R. I. course yet. I am grateful for your training and co-operation to date and look forward to still bigger success when I graduate."

Clarence Heffelfinger, Temple, Penna.

$500 a month

"When I enrolled with the N. R. I., I was a motorman on a trolley car. Now I have a fine, fast-growing Radio business. When only half way through the course started bringing in extra money. I made $420 in my spare time. Now I have a bank account of $2800 and about $300 worth of stock. It has all come from Radio since graduating less than six months ago. I cannot begin to express my thanks to you and all those connected with N. R. I. for what you have done for me."

Richard Butler, 3535 Sheffield St., Philadelphia, Pa.

$450 a month

"In addition to my regular work in what I believe to be the largest and best equipped Radio Shop in the Southwest, I am now operating KGFI. I am proud of the fact that I installed and put KGFI on the air without help of anyone except the N. R. I. I am averaging $450 per month."

Frank M. Jones, 922 Guadalupe St., San Angelo, Tex.

READ *what* Big Money *my men make in* RADIO

$350, $450, $500 a month. That's making real money. What business other than Radio offers such opportunities after six to twelve months training? None that I know of. More proof—last year electricians, farmers, mechanics, clerks, railroad men, bookkeepers, preachers, doctors, and men from 78 other trades and professions enrolled with me to prepare for the Radio field.

Big Growth Making Many Big Jobs

A WONDERFUL business, you will say, to make men trained for other fields, give them up for Radio. Yes, but they had their eyes wide open. They know what you and I know—that big growth makes big jobs and many opportunities to earn big money. Heffelfinger, Jones, and Butler couldn't make anything like this money before, although they probably worked just as hard—maybe harder. Trained men are needed for the big jobs the amazing growth of Radio is creating.

Salaries Up To $250 a Week

WHY go along at $25, $30, $35 a week when the good Radio jobs pay $50 to $250 a week? Cut loose from drudgery, small pay, no-future jobs. Get into a live-wire field that offers you a real chance. You don't need a high school or college education to become a Radio Expert. Many of my most successful graduates didn't finish the grades.

Practical Experience With Course

I GIVE you six big outfits of Radio parts. With them you can build and experiment with one hundred different circuits—learn the "how" and "why" of practically every type of set made. This makes learning easy, interesting, fascinating, your training complete. Nothing else equals my method.

TELEVISION also Included

YOUR knowledge of Radio will be right up to the minute with Radio's progress and inventions when you take my training. Television, the new field for Radio experts, is included. Not one system for sending and receiving pictures by Radio, but all of them—Jenkin's, Cooley's, Bell's, Baird's, Belin's, Alexanderson's.

Television can easily and quickly become as large as the whole Radio industry is today. Broadcasting stations will soon need trained men, so will manufacturers for the designing and building of sending and receiving sets. It won't wait for you. Get ready quick.

THIS IS RADIO'S BIGGEST YEAR

I GIVE YOU THE RADIO PARTS FOR A HOME EXPERIMENTAL LABORATORY

WITH THEM YOU CAN BUILD 100 CIRCUITS. 4 YOU BUILD ARE SHOWN HERE. MY BOOK EXPLAINS THIS PRACTICAL FASCINATING WAY OF LEARNING RADIO

Get a copy Free

I Will Train You *at* Home in Your Spare Time

NO NEED to leave home. Hold your job, give me one-half to one hour a day of your spare time. In six to twelve months you can be a trained Radio Expert, ready to step into a new job with a real future.

$10 to $30 a Week While Learning

MANY of my students make $10, $20, $30 a week extra while learning. I teach you to begin making money shortly after you enroll. G. W. Page, 1807 21st St., Nashville, Tenn., made $935 in his spare time.

Money Back If Not Satisfied

I KNOW the kind of training you need. I have put hundreds of men and young men ahead. I am so sure that I can satisfy you too that I will agree to refund your money if you are not satisfied when you complete my course.

Find Out What Radio Offers You

MY 64-page book explaining where the big jobs are and what you can make is FREE. Mail coupon. No obligation.

Address: Dept. 9XAE
J. E. Smith, Pres.,
Nat'l Radio Institute,
Washington, D. C.

Send this Coupon

J. E. Smith, *President*,
Dept. 9XAE National Radio Institute,
Washington, D. C.

Dear Mr. Smith:—Send me your book. I want to know about the opportunities in Radio and your practical method of teaching at home with six big outfits of Radio parts. This request does not obligate me to enroll.

Name ..... *Age* .....

Address .....

City ..... *State* .....

Vol. 1
No. 1

Science WONDER Quarterly

FALL
1929

Editorial, Advertising and General Offices, 98-00 Park Place, New York, N. Y.

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These nationally-known educators pass upon the scientific principles of all stories.

..... Prophetic Fiction is the Mother of Scientific Fact ~ .....

$500.00 IN PRIZES

WITH the next three issues of SCIENCE WONDER QUARTERLY, the publishers will give $500.00 in prizes to the winners of an entirely new contest in which every reader of this magazine can join.

In publishing a number of science-fiction magazines, the editors feel that they have a great mission to perform; their mission being to get the great mass of readers, not only to think what the world in the future is likely to become, but also to become better versed in things scientific.

But it is impossible for us to succeed in our mission unless our science-fiction readers preach the gospel of science fiction, wherever and whenever they have a chance to do so.

The select group of science-fiction readers which now exists is a marvelous nucleus for the far greater mass of readers that are yet to come. It would seem to be a great privilege for the present group to spread the new gospel far and wide.

Many readers are, of course, doing this already; but they are not anywhere near numerous enough, and it is for this purpose that we are inaugurating this prize contest. All we are interested in at the present time is to spread the gospel of science fiction.

For instance, one youngster of only twelve writes and tells us how, in the boys' club he belongs to, and in his science classes at school, he often reads the stories from our magazines aloud to the great enjoyment and delight of his listeners. There are also in existence several clubs whose prime purpose it is to discuss science fiction and, in addition, to contribute stories and letters to the science-fiction magazines. Recently another young man was instrumental in having his local newspaper reprint a number of science-fiction stories; which is another way to get the public science-fiction-minded. There are, of course, any number of schemes by which the spread of science fiction can be accomplished, and we are willing to pay $500.00 in prizes for the best efforts in this endeavor.

The prize contest might, therefore, be headed by the caption, *"What I Have Done to Spread Science Fiction."*

In every issue for the next three numbers, three prizes will be given, as follows:

FIRST PRIZE — $100.00
SECOND PRIZE — $ 50.00
THIRD PRIZE — $ 20.00

A total of over $500.00 for the three next issues of the QUARTERLY. The closing dates for these contests will be Nov. 15, 1929; Feb. 15, 1930; May 15, 1930.

It will be run as follows: In the Winter, 1929; Spring, 1930; Summer, 1930 issues of SCIENCE WONDER QUARTERLY we will award the prizes for the best letters, *with the accompanying proofs*, of what our readers have done to convert others to science fiction. The efforts that our readers put forth may be in the way of talks before clubs or school classes, letters written to friends or relatives, letters to local newspapers, etc. The proofs and letters that are offered should be as conclusive as possible; in order that the editors may really judge adequately the merits of the contestants. The proofs may be clippings from newspapers, letters from editors, friends, relatives, subscriptions obtained, etc. All material in this contest must be addressed to Editor, Prize Letter Contest, SCIENCE WONDER QUARTERLY. Understand that *this is not a subscription contest*. Our purpose is only to convert others to the cause of science fiction.

The first series of prizes and the letters will be published in the December issue of SCIENCE WONDER QUARTERLY. The prizes will be based on the evidence offered and the sincerity and enthusiasm of the contestants as expressed in their letters. No letter should be longer than 500 words. In case of a tie, an identical prize will be paid to the contestants so tied.

The Next Issue of SCIENCE WONDER QUARTERLY Will Be on Sale December 15, 1929

The SHOT into INFINITY

by Otto Willi Gail

They told about the devil's work on the plateau. The earth had been torn up, a hellish glow had flooded the mountains and everyone thought it was the end of the world.

PREFACE

(Which may be read through or not)

WHEN the ingenious Jules Verne wrote his "Journey to the Moon," he did not suspect how soon this problem would engage the attention of serious physicists. What he consciously treated as a fantastic utopia is to-day close to realization, and perhaps the first rocket is hissing on its way into space before this book leaves the press.

The "Shot Into Infinity" is no utopia. The technical basis of the novel rests on the results of the most modern research and physical facts, and it is nothing but the development of the practical applications of discoveries which are no longer questioned to-day.

Very often persons who undeniably possess a certain degree of judgment have asked me, with a superior and almost pitying smile, whether I seriously believe that someday people might be able to leave the earth. Once and for all let this question be answered in this place by a counter question: Why not?

In the final analysis the possibility of all the marvels of the technology of transportation depends on brute force. When the motor was invented which afforded half a horsepower for each kilogram of its own weight there sprang into existence the airplane which hitherto had been decried as a mad fantasy and speedily a way was found to overcome the little extra problems of the designs of the wings, the propeller, and so forth. The motor which is to carry persons (or for that matter itself only) into space must actually develop more than 100 H. P. for each kilogram of its own weight, in order to be able to combat successfully the powerful attraction of the earth. But unless all appearances are deceptive, this motor has already been invented or at least is *en route* to discovery.

In particular two scientists of world fame have been working at this problem for years—Prof. Hermann Oberth, a German, of Mediasch, and Prof. Robert H. Goddard, an American, of Worcester, Massachusetts—and both have solved it, though for the present only theoretically, by means of the rocket motor. Once this mode of propulsion (which is not dependent on any atmospheric resistance and develops its full efficiency only in a vacuum) has maintained itself in practice, then the "space ship" itself becomes an alluring but absolutely solvable problem for skilled constructors. For what the uninitiated regard as unconquerable factors, the fearful cold in space, the lack of air to breathe, the absolute absence of weight, are not at all real hindrances, and we may confidently assert that the engineers of 1930-40 will be able to make vigorous assaults on these problems with air generators and heat insulators.

To both of these gentlemen I herewith express my sincere admiration and my hearty thanks for their co-operation.

Of all the investigators who devoted themselves to the problem of the navigation of space, at present the American Professor Goddard seems to be the most successful; for if the last reports from Worcester are accurate, in the near future the first Goddard experimental rocket (without passengers) will ascend to the moon, and mankind is at the eve of a veritable new epoch in world history.

OTTO WILLI GAIL.

OTTO WILLI GAIL

IN presenting this complete novel, we wish to call attention to the fact that this story was published first in Germany. The present translation was made on behalf of SCIENCE WONDER QUARTERLY, the translation being done by an American, Francis Currier. This is the first English translation, and SCIENCE WONDER QUARTERLY has acquired all rights for this story in the United States.

The story was selected by the editors of the QUARTERLY because it is without doubt one of the greatest, if not the greatest, interplanetarian story published in recent years.

With complete German thoroughness, the author has not written simply a science-fiction story, but has incorporated in it the latest scientific advances in the new art of space-flying.

It may be said without fear of contradiction that the material contained in the greater part of the story has never been used by any science-fiction writer before.

While writing the story, the author has had the collaboration of practically all the German scientists who have of late come into prominence in their researches, into not only rocket flying, but space flying and astro-physics.

The scientific angles contained in this story are as accurate as the present art permits, and may be termed prophetic in many ways.

There is nothing contained in this story that might be termed fantastic, so far as the future is concerned. Sooner or later the art of navigation of outer space will catch up with the predictions contained in this unforgettable story. It is certain to become a classic of its type before many years have passed.

CHAPTER I

Mysterious Happenings

IN one of the ravines which transverse the southern portion of the Carpathians in their steep descent to the Wallachian plain—between the romantic deeply-cut valley of the Oltu River and the pass of Predeal, over which the express trains thunder on the way from Czernowitz to Bucharest—lies the lonely monastery of Valeni.

A bad, almost untravelled road branches off from the highway above the village of Suicii and winds between darkly-wooded crags in its easy ascent to the old walls of the monastery. Long forgotten and a prey to the moss and vines, the monastery clings to the mountainside, a reminder of times long past when the orthodox Carpathian monasteries changed into stubborn castles and stout defences against encroaching Islam, and the spiritual lords were no less practiced in weapons than the bailiffs and dukes of Swabian fortresses.

* * *

It is now more than a year and a half since the inhabitants of Suicii were surprised by an unexpected visit. The strangers arrived with a line of trucks, no one knowing whence they came or what they wanted. Then wagons came almost daily from the Oltu valley, laden with tools and building material, chests, furniture, and mysterious machinery.

Curiously, yet shyly, the villagers watched, as gradually a little colony grew in the valley of Valeni—as electricity and radio made their appearance. But none of the strangers understood Roumanian or Hungarian, and so the purpose of the new colony remained a riddle. Even the magistrate in Calimanesti knew only that the people were from Little Russia and were workers of the oil magnate Romano Vacarescu, to whom the forests about Suicii belonged, and that they were to build some dwelling houses near the monastery of Valeni.

At length the excited minds were eased; people became accustomed to the increase in population, and continued to till the cornfields and to drink the inevitable plum brandy. But one day curiosity was newly aroused by the story of a shepherd who came from Magura Cozia.

On the open plateau between Cozia and the damp valley of the upper Arges River strange buildings were being erected. Heavy concrete pillars, surrounding a circular open space, rose high in the air. Within was being built a peculiar structure, about which nobody could form a clear idea. Some claimed that it was the dome of a fortified tower, others asserted that a mighty memorial monument was being erected there, and extremely clever persons could tell (from some certain source or other) about an airport which promised Suicii greater economic importance.

But as the construction proceeded, the entire plateau was surrounded with a high fence and the entrances were carefully guarded. Thus the imaginations of the natives had free run, and soon the most impossible stories about the mysterious structure were current.

There was also great activity within the ancient walls of Valeni. Heavy hammer strokes thundered from the subterranean cells, machines hummed day and night, and thick clouds of smoke poured from the newly erected chimney. In the abandoned monastery yard rose heaps of coal; oil tanks and steel cylinders stood in long rows by the walls; and thick bundles of electric wire ran from the monastery, some across to the plateau and others to the dwellings of the workers.

At night, when the Roumanian mountaineers were sleeping in their sheepskins on the wooden porches of their mud huts, a bright illumination shone from the old walls and cast trembling reflections on the black mountain side.

A Meeting in the Monastery

AN impressive automobile sped through the winding valley of the Oltu. The narrow foot of the valley, between the closely crowding Carpathians, gives barely room enough for the road, the river, and the single track railway which runs obliquely through the mountains from Hermanstadt to Slatina. Fairly often, in fact, the highway crosses the rails and traverses the Oltu River on shaky bridges. Coming from Ramnicul Valcea ("Garmisch," as the people of Bucharest term it), the car took the sharp curves before Calimanesti at undiminished speed, climbed with a rattle the ridges of Berislavesti, and crossed Suicii in its mad course. The natives humbly knelt: they recognized the green car of the man who owned the oil wells of Ploesti and countless square kilometers of Carpathian forest.

By speculation on a grand scale the insignificant little Roumanian had in a few decades amassed a fortune reckoned among the greatest in the country. Oil and wood had been his motto: oil for export, bringing him good foreign money, and wood for the wide treeless plains of Wallachia.

The car stopped squarely before the monastery.

"Where is Mr. Suchinow?" the passenger demanded of the young man who promptly opened the door of the car. He spoke French, the language of an aristocrat of Bucharest.

"Monsieur Suchinow is waiting for you down at the office."

"Too bad! Call for me again in an hour and a half," he ordered the chauffeur, and then he descended into the dark cells of the monastery.

In the narrow corridor leading to the office, a slender man came to meet the visitor.

"You are punctual, Monsieur Vacarescu. How was the trip across the mountains?"

"No circumlocutions, if you please, Monsieur Suchinow! I do not enjoy idle conversation when it is a matter of business."

The reproved man remained silent. He knew the peculiarities of the fat little financier and yielded to them.

The two men entered the office, a comfortably furnished room, the thick walls of which muffled the noise of the workshops; the incessant hum of the high frequency generators operating close by was noticeable only because of a slight trembling of the walls and furniture.

"How far along are you?" asked Vacarescu, curtly, sinking back into a chair with a sigh.

"Finished!" replied Suchinow, still more curtly. On his face, which was strangely dotted with green spots, lurked the shadow of a contemptuous smile.

"Finished except for . . . . ?"

"Except for nothing!"

"Do you really mean that the rocket can now be released at any moment?"

"Tomorrow evening at nine twenty-five sharp (Central European time) it must be released, unless I want to loaf around thirteen days more until the next quadrature* of the moon."

The fat financier seemed to have had his breath taken away. His surprisingly narrow hooked nose, which seemed entirely out of place on his fat broad face, trembled as though threatening to fall off.

"And I? And our company?" he snorted.

"Yes, you must certainly hasten, if the Transylvania Company is not to get ahead of you at the last moment!" remarked the slender man pleasantly.

"You have a nerve!" exploded Vacarescu angrily.

"No idle conversation, if you please, Monsieur Vacarescu! It is a question of business. We can be finished in a few minutes. The contracts are ready. Have you deposited the money?"

"I am going to protect myself. First, this matter of the Budapest account does not suit me. If the rocket does not return, I lose my money for nothing. Now tell me, who is to steer the thing?"

"Skoryna—you know very well."

"Do you really expect me to settle a fortune on this untried lad with the peaches and cream complexion?"

"Sir," replied Suchinow sharply, "you must certainly entrust all these arrangements to me, whether for good or ill."

"For my money I can probably demand some guarantee, too!" said the irritated Vacarescu.

"Does not Skoryna guarantee matters with his life? What further guarantee do you wish?"

"Bah! a valuable life for twenty thousand English pounds!" jested the financier maliciously.

A shadow crossed the green-spotted face of the Russian.

"Can one balance a human life with money, Monsieur Vacarescu? Even the life of an—an engineer like Skoryna? I beg of you to regard the discussion of this point as closed."

"At least, your preparations have remained secret?"

"Certainly, so far as is humanly possible. Of course the press notices and the information for the Lick and Babelsberg observatories are already prepared. The radio announcements are to be sent out immediately after the signing of the papers."

After a short pause Suchinow suddenly asked:

"Why do you set such store by absolute secrecy?" He looked slyly up at the man opposite.

"I should not like to have this German—what is his name, anyway?—"

"August Korf."

"Right! I do not want this Korf to take a hand in our game. I trust he knows nothing about it."

"How should he? After all, what harm would it do? He has not yet finished his first experiments, and he could hardly make up my head start. By the time he can think of competing with us, we shall long since have set the world in an uproar and your foundation will be established solidly. Do you doubt that?"

Vacarescu thoughtfully twirled his watch-chain.

"I cannot help thinking that this Swabian will somehow upset our calculations."

The inventor grew pale. Anxiously he examined the expression of the financier, and he nervously drummed on the arm of his chair.

"How so?" he asked with forced indifference.

"Do not underestimate this rival! You know that he invented the rocket at about the same time as yourself; he knows the dynamic cartridge; and lately he has been asserting that he can attain twice as high a repulsion-speed by using liquid explosives. Some day this man will come into the open with some startling revelations, and then you and I are in the soup."

At these words, offering no interpretation but the speculator's anxiety about his investment of capital, the tension in Suchinow's face was released.

"I see perfectly well, Monsieur Vacarescu," he said calmly, "that you have so little confidence in me and my—in Skoryna, that it is doubtless best for us to break our relation and for the Transsylvania Company. . . . "

"For Heaven's sake!" interrupted Varcarescu, almost screaming at him. "You shall have your deposit! But the Lord help you, if we fail!"

With a smile bordering on pity Suchinow lifted the telephone receiver:

"Connect Monsieur Vacarescu with the Bucharest Bank of Roumania—yes, the president himself—very well, then call up here."

Then he opened the door of a little cabinet built in the wall, took out some papers, and spread them over the table.

"Here, Monsieur Vacarescu, is the transfer of license, here is my appointment as general director of the Transcosmos Stock Company, here is the sealed envelope with Skoryna's will of the twenty thousand pounds, due from the Budapest account in the case of his death, likewise the statement of your message to the Bank of Roumania (which you yourself will telephone in a few minutes)—and here is ink!"

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* The moon is in quadrature when a line drawn from the earth to the sun to the moon makes an angle of 90 degrees. Suchinow evidently did not want to travel directly toward or away from the sun.—*Editor.*

CHAPTER II

Uncle Sam

A SUNNY day of late summer was ending. The light wind which at noon had ruffled the surface of Lake Constance was ceasing, and the last dying waves were splashing on the shore.

Far out on the lake shone in the rays of the evening sun the dazzling white sails of a little yacht. It seemed motionless. The main boom swung back and forth at random, the foresail hung down limp, and the tiny current of air could not even keep up the pennant at the mast-head.

The steersman attentively viewed the horizon and the little white clouds that swam over the Alps, glowing in the sun.

"After sundown there may be a breeze again," he said to his companion; "we now can only choose between waiting and rowing. What do you think, Uncle Sam?"

"I think," replied the latter, "that we have time to wait. If the evening breeze fails us, we have at worst lost a couple of hours—or gained them, my boy! Such a splendid evening calls for enjoyment."

The helmsman rose, secured the tiller and sheet, and made himself comfortable on the forward deck.

"Just see what a festive cloak the mountains have put on to receive me. Truly, old *Zugspitze* yonder is blushing for joy that old Sam has returned. Lad, how beautiful our home is!"

"It is true, Uncle. But can all this still impress you, a man who has hunted in the jungles, meditated beside the Ganges, and frozen in Tibet. Can our poor little *Zugspitze* still seem striking to you who have seen Mount Everest rise into space?"

Uncle Sam slowly and thoughtfully filled and lighted one of his pipes, which he always carried with him in large numbers, projecting from all his coat pockets. Then he inhaled deeply, so that there was a gurgling within the beloved pipe; he blew a mighty cloud of smoke into the air and said, as soon as this busy occupation gave him time:

"Everywhere in the world there are beautiful and noble things, Gus. Yet it is always a matter of the relation in which you stand to them. See, this Everest you spoke of: you look at it and at the same time you realize that it is the highest point on earth—it is unfortunate that this is known—you reflect about the nine thousand meters, reckon and consider—puzzle your memory over all the trifles you had in school concerning this marvel of a mountain—and by the time you have successfully digested all this, you have travelled on. And you have not even become acquainted with the proud king who sits at his record height and with cool graciousness waves farewell to you from afar.

"But our Alpine range here, with yonder the abrupt descent of *Zugspitze* and across the lake *Pfänderhügelchen:* these are no record-seekers, only dear old friends whom I well know. Isn't that so, old fellows? You still remember your old Samuel Finkle!"

In youthful exuberance the man of fifty waved his hat in greeting to the mountains of his home.

"See," he went on, "it is so with everything. There is nothing in the world of which one can absolutely say that it is good, it is beautiful. It is always a question of good and beautiful for whom—that is it."

Reflectively he spat into the water in a great arc.

"As long as your dear sister was still alive, I never thought of leaving our Alps. But when she fell at the Wettersteinwand—well, you know all about it—when we had buried her, then I cursed the mountains; I could no longer bear to look at them, and I went to India to the jungles. But that is long ago, and I have pardoned the mountains for not watching over her better."

Then both lay silent, close together on the slightly rocking deck, listening to the lapping of the tiny waves on the side of the boat and letting their glances sweep into the greyish blue infinity.

August Korf, the famous chief engineer of the national airport in Friederichshafen, pressed his uncle's hand sympathetically. In reality the little man beside him, all dried up by the tropic sun, was not his uncle but his brother-in-law, and Dr. Samuel Finkle owed his position as "uncle" only to their noticeable difference in age.

"Uncle Sam," said Korf after a while, "better dead than—than lost!"

"What! You, also?" In surprise the old traveller looked up.

"No, no, Uncle! It was only an idea!" protested Korf.

A Question of Astronomy

THE sun had set. The sky was growing darker, and in the southeast Mars already glowed with its reddish light. Venus, the evening star, pierced the golden yellow glow of the western horizon; gradually the two Dippers lit their torches, and the "W" of Cassiopeia rivalled in splendor the sparkling starry cross of the Swan.

"Gone and carried away!" the engineer broke the stillness. "The evening breeze is not yet stirring!"

"That's the mischief of it!" said Uncle Sam in comical excitement. "You claim to conquer the universe and you cannot even conjure up a little bit of ridiculous terrestrial wind, which we need for the trip home."

Korf smiled. "Perhaps it is easier to rule space, the absolute nothingness, with its rigid laws, than the 'ridiculous terrestrial wind,' which is dependent on a thousand influences. In space it is calculation alone that conquers."

"Are you so sure of this? Do you think that chance is entirely excluded in the universe?"

"What is chance? Is there really chance, or is it not in the last analysis a phenomenon the laws of which at present still escape our knowledge? Surely it can safely be assumed that the possibility of uncalculable phenomena is reduced to a minimum, so that (strange as it may seem) human knowledge controls space better than it does numerous phenomena on our little earth."

"But this minimum may suffice to shatter all your plans." Dr. Finkle energetically drew at his pipe. "How closely defined are the limits of our life! A change in temperature of a few degrees is sufficient to cause death. On the tiny layer between the glowing center of the earth and heatless nothingness of space live man, beast, and plant; it is merely chance which has left exactly this space for the possibility of life. It is a trifling fact on which our life is based, and only an equally trifling impulse is needed (for which your 'minimum' easily leaves room enough), in order to destroy it—to blow out with a breath an insignificant little human being who rashly seeks to leave Mother Earth."

"Granted, Uncle Sam! Just such an opinion was once expressed by the city council of Nuremberg, when the first railroad to Fürth was to be built, yet today the express trains speed from Paris to Stamboul.

"Shall I stop because of this minimum in the possibilities of failure? Shall I destroy my invention, because it perhaps is not yet perfect? Shall I withhold from mankind a considerable advance in knowledge, because it may perhaps lead to disappointment?"

"Gus, you misunderstand me. Believe me, I admire you and your work, which I hope you will soon show me. But I doubt whether this constant advance in external knowledge is a blessing for mankind. Do you believe that motorists and aviators of the twentieth century are happier than the subjects of Frederick the Great, for whom a journey from Brandenburg to Cassel was an event prepared months in advance—a real experience? Who has such experiences today? Will not external knowledge celebrate its triumph at the cost of inner knowledge—and then shall we have gained anything? I dread outspreading civilization, if it destroys concentrated culture."

Korf did not reply, and for a while old Sam was also silent, knocking the ashes from his pipe on the side of the boat.

"Do you believe that man-like beings inhabit the stars?" he then asked very suddenly.

"Hardly; that is, I do not know. On the seven known planets conditions prevail which exclude the existence of living albuminous cells. The only planet whose temperature and atmosphere offer any possibility of vegetation and accordingly of life is Venus. But all investigations and observations indicate that no rational beings live even there. And of the planetary systems of the so-called fixed stars we know nothing or practically nothing."

"I will tell you something, Gus. You engineers and scientists are extremely clever persons, but somewhere in each of your brains is a gap. You can calculate until a person gets dazed, but thinking is something that you cannot do."

"You are exceedingly complimentary, dear Uncle!" said Korf with a laugh.

"Well, please give me a single valid reason—valid, you understand—why among all the millions of worlds the little clump we call earth should alone be selected to have the heritage of life and reason! Well?"

Samuel Finkle did not seem to expect an answer. Rolling over on his side, he took from his trousers pocket a new matchbox, twirling it in his fingers, which resulted in splitting a joint of the box. He continued his remarks:

"It is megalomania to believe that! At least now, after science has robbed our earth of its ancient position as the motionless center of the universe and has assigned it the modest place of a planet circling about the sun."

"Of course you do not venture to disturb the eminent position of the sun, do you?" said Korf, amused by his uncle's zeal.

"Of course the sun must revolve about some central star or other, in my opinion Sirius, and the latter again about something more central, and so forth."

"Then you do grant a certain order of rank, Uncle. Central, more central, still more central, most central of all. . . ."

"With you mathematicians a fellow cannot speak a sensible word. Are you trying to make a fool of old Sam?"

"No, Uncle." Korf became serious. "But one thing is certain: the earth does not revolve around the sun, any more than the moon revolves around the earth. It only seems so."

"It only seems so?" Uncle Sam's pipe had almost fallen from his mouth in his surprise. "Do you know, Gus, things cannot so easily amaze an old globe trotter like me, but I am exceedingly amazed that you should mock your good uncle this way!"

Having spoken, he rolled over on his side, evidently hurt and firmly resolved to regard the conversation as closed.

"Just think a bit, Uncle; you can do it better than I! Where would your theory be with regard to the equality of the stars and consequently the rational beings living on them, if you allow the sun the rank of a central star? I only want to confirm and supplement your theory. The universe is more democratic than you think."

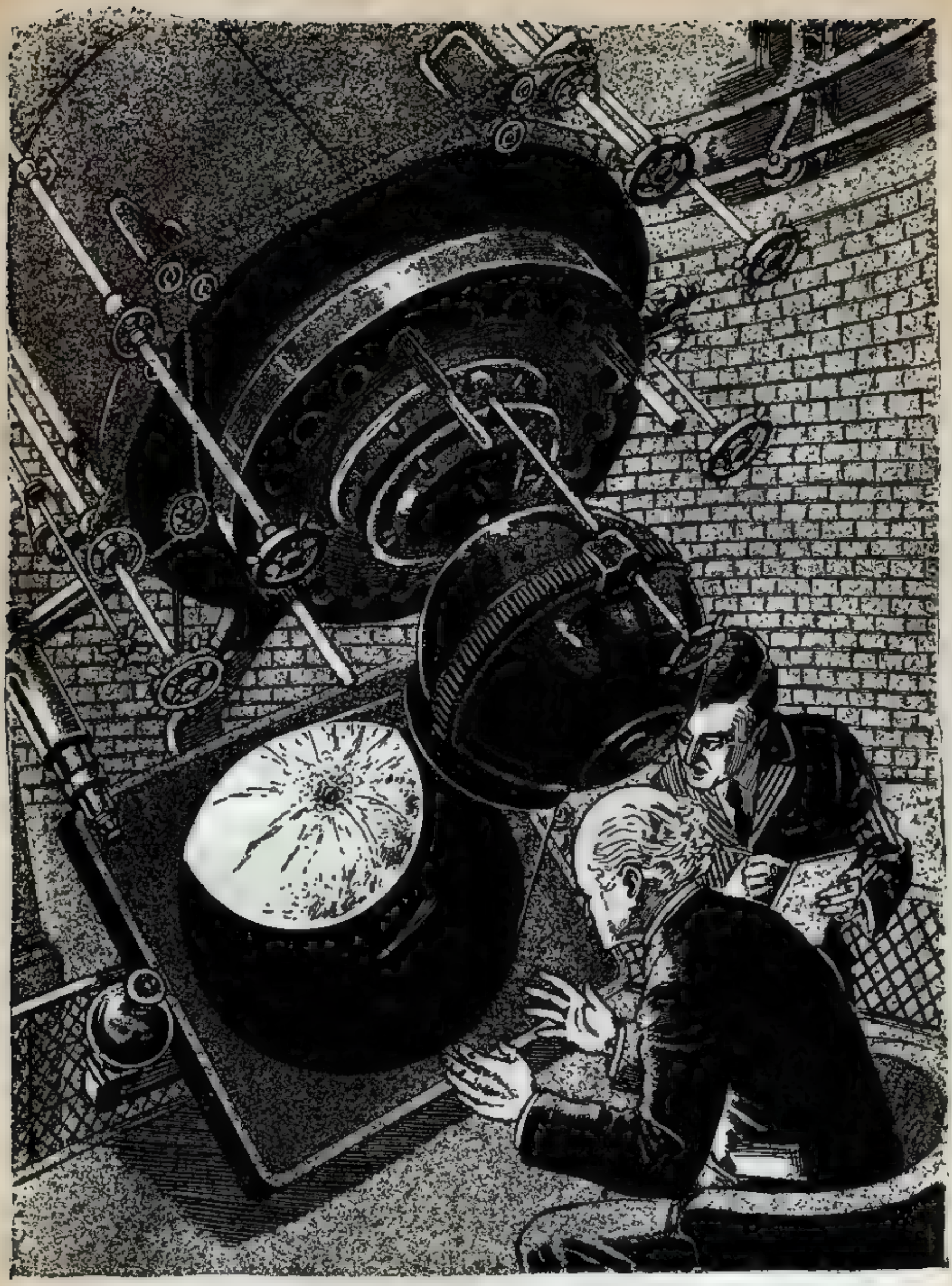
Already old Sam broke his resolution and condescended to call back over his shoulder: "What the devil does the earth revolve around, if not the sun? Are you accusing old Kepler of lying?"

"Around a point, Uncle; around the same point as the sun itself, around the common center of gravity, which on account of the immense mass of the sun lies so near its center that we may well pardon this slight error and calmly pass over it. Won't you be kind enough to turn back again?"

"Then I am right, am I not?" said Sam, making a half-turn.

"Surely, Uncle! On other heavenly bodies there may well be rational beings. But as long as it is not proved, we must leave the question to philosophers and novelists. But look! The evening breeze is coming!"

Quickly he released the tiller and sheet. On the greenish black surface of the lake appeared bright



S-O-S: S-O-S came the flashes of light from space from an infinite and unattainable distance. Then the dot of light by the moon went out.

trembling streaks, coming nearer and nearer, precursors of the expected breeze. In a few seconds it reached the yacht, inflating the canvas and making the loosely flapping jib crack like a whip.

"There, Uncle Sam, this will be a speedy return trip. Look out, I am going to tack!"

The bow cut through the waves, casting up the spray; the wind sang in the shrouds; before the lake sank into complete darkness, the yacht was rocking at its buoy.

Bluff or Reality?

IN the pure sea air of California, at a considerable height above sea level, stands the great Lick astronomical observatory enjoying, more than any other, especially favorable conditions for the observation of the northern sky. The dustless air permits the use of such great magnification that the aged observer, Nielson, chose as the special field of his researches the exact study of the surface of the moon. Nielson was also considered the chief authority in the observation of the little planet Mercury, visible only in the uncertain half-light of evening or morning.

On the evening of the sixth of September the aged scientist was startled out of his calm and peaceful contemplation of the magnificent surroundings by an amazing radiogram. Carefully he studied the dispatch, uncertain whether he should regard the message as serious or as a poor jest.

"What do you think of that?" he asked his assistant.

"Suchinow—Suchinow!" replied the latter. "That must be the Russian who caused so much excitement by his work on the conquering of space by means of rocket propulsion. Do you remember, sir? He claimed that he had solved the problem and that he could actually carry out his plans, as soon as he had at his disposal a propulsion material with a latent chemical energy of about 60,000 calories per kilogram. When his experiments at that time always failed, the matter was regarded as mere fantasy. Perhaps he has now really found a sufficient source of energy."

Shaking his head, the old astronomer reread the telegram:

"September 7, 9.25 P.M. Central European Time, Suchinow moon rocket leaves 45° 16′ 40″ N. Lat., 24° 34′ 30″ E. Long., Greenwich. Observations please, Transcosmos, Bucharest."

"According to our local time that would be tomorrow afternoon at one," said the assistant. "By day we can hardly see much."

"Still less at night, if the rocket is not sufficiently illuminated," answered Nielson. "Do you really believe it at all?"

"It is not impossible. If the Russian has an energy accumulator of sufficient capacity, the matter is hardly to be doubted; spatial navigation has thus far failed only on this one account."

"Man, do not tempt the gods!" murmured the aged astronomer into his grey beard. Then he said aloud: "Make the necessary preparations and have the observatory ready at any rate by six o'clock tomorrow afternoon. Before that we can hardly expect to make an observation."

In spite of his great doubt of the success of the enterprise just announced, Nielson spent the night in feverish excitement.

"Shall I live to see it," he thought, "this marvel of man's leaving the earth and rashly peeping behind the moon?"

Then there awoke in him the interest of a scientist who had devoted a whole life to his research. At last mankind was to receive enlightenment and certainty regarding the appearance of the part of the moon which had been hidden from the earth for thousands and millions of years! The fabulous three-sevenths of the surface of the moon, about the nature of which there was no explanation but surmises and hypotheses: very plausible, indeed, but mere hypotheses after all!

The apparently inexplicable mystery was about to be solved, and he —Nielson—need not take the question unanswered to his grave.

That night he did not close his eyes. In excitement he ran back and forth between his study and the giant telescope in the dome. Then he went down the steps of the tower and walked about in the open.

The moon shone in its first quarter through the pure sea air. It seemed to be laughing at the stir which human beings were making about its hidden side.

Nielson became thoughtful. He knew very well the problem of the space ship, which years ago had been widely published in all the papers and had then sunk into oblivion, since there could be no practical solution in view of the lack of a proper fuel. Likewise he did not regard it as impossible to send a shot from the earth; but could a man withstand the fearful initial acceleration? What was the use of a space ship without an observer? The radiogram had given no information on this score.

What if it were only a bad joke which he was taking as something serious?

Slowly the night went by, still more slowly the following morning. It became afternoon. Now, at this very moment, the shot was taking place, provided the news was correct. Nielson could hardly conceal his excitement any longer.

The hours dragged by. On some pretext or other he busied himself in the dome where the assistant, on the movable platform, was sitting in readiness at the eye-piece, constantly observing the eastern sky.

"I see nothing yet, sir!"

Evening set in, and still the report of the observer was the same: "I see nothing yet, sir!"

Was it possible that some joker. . . . ? But Nielson said to himself that by daylight an observation was scarcely to be expected; the shot naturally could not be very large, and the presumably very high angular velocity must quickly take it from the observer's field of vision. By night, however, perhaps they could see the rocket with the naked

eye, assuming that it radiated a strong light, and could point the telescope accordingly.

Nine o'clock approached.

"We are now in the same relative position to the sun as the starting point of the rocket at the time of the discharge. Now it must be visible, if it is illuminated, provided it was sent at all." Nielson climbed the ladder to the observation platform, to relieve his assistant. With trembling fingers he turned the eye-piece, to adjust it to his old far-sighted eyes. The mighty tube was almost vertical, for by now the rocket had to appear somewhere near the zenith.

Vainly he scanned the heavens. Time passed; morning approached; nothing!

But wait! A cry of joy escaped the aged scientist. There on the firmament was a glowing streak. In a loud voice he called the assistant.

"Is it visible, sir?" asked the latter hastily.

"We have been swindled, after all!" replied Nielson, disillusioned. A meteor had tricked his fevered imagination. He left the observatory, utterly exhausted.

CHAPTER III

Korf Hears the News

COUNCILLOR HEYSE, the director of the national airport at Friedrichshafen on Lake Constance, was sitting in his private office and turning the leaves of a heap of newspapers. One item in particular seemed to hold his attention. Hastily he threw away his cigar and pressed the button of an electric bell.

"Please send me Chief Engineer Korf at once!" he said to the clerk who answered the bell.

In a few moments appeared the man sent for, a broad-shouldered blond fellow, the technical brain of the Victoria airport.

"My dear Korf," the director greeted him heartily, "I must unfortunately give you some bad news. Please sit down.

"You know," he went on, "that we cannot carry out your project until we have the necessary money at our disposal. My visit to the government to establish a suitable credit has unluckily met with no success. Reconstruction, cutting down expenses, government economy, the burdens of the peace treaty—those were the ever recurring arguments on which the refusal was based. We may absolutely give up hope."

"Then I must simply turn to the public, councillor!" said Korf calmly. "The masses will have more understanding than the narrow-minded parliament."

"Do not hope for too much!" interjected the director thoughtfully.

"Let the director recall the Echterdingen catastrophe, when Count Zeppelin's dirigible came down in flames and was destroyed. In spontaneous recognition of the greatness of Zeppelin's work the German people opened heart and purse, and in a few weeks millions were at Zeppelin's disposal. And to-day it is a question, not of controlling the air but of conquering space, the universe."

"You are an optimist, my dear Korf!" replied Heyse. "The public is as yet too little acquainted with you and your work. Your invention is not trusted, and—believe me—the Germans give no money without assurance of success, especially in this general shortage of money.

"Exhibit your space ship to the public, travel in it to the moon, with a safe return; then, indeed, you may have any sum to build further models."

"This is just the tragedy of many great inventions! First success, then money! And if success is impossible without money, the finest thing sinks into oblivion."

"You are looking at the dark side of things, councillor!"

"What do you estimate as the lowest possible cost of the first ship?"

"From eight to nine hundred thousand marks will suffice. A still smaller and cheaper model is unfortunately impractical. One would think that this sum could be collected. Just ten pfennig from every wage-earner of Germany would be enough. If the nation realizes what the question is, it will gladly sacrifice a few pfennig."

"Yes, if the nation realizes. But it realizes only what it sees. And then, one more thing: you are too late. The Russian is already at the goal."

"What Russian?" asked Korf absently.

"You surely remember the Suchinow publications of two years ago, in which exactly your idea of the space rocket was worked out. . . . ."

"Oh, yes! I know. He only lacked the principal feature, the dynamic cartridge!" said Korf with a laugh.

Director Heyse excitedly turned the pages of the newspaper.

"It is not so harmless as that! The man seems to have invented the dynamic cartridge or an equivalent substitute. Here, read this!"

Quickly Korf seized the paper. On the first page, in heavy type, running the entire width of the page, he read:

"The shot into infinity has become reality. The following startling radiogram has just arrived:

"'Bucharest, September 7, 11 P.M. To-day at 9.25 P.M. start of Suchinow space rocket from Calimanesti to moon. Further news follows.'

"We give this report with reservation. A confirmation of the news is awaited. As we fully reported in No. 47 of last year, Dimitri Suchinow of Little Russia about two years ago conducted the first experiments. . . . ."

Korf read no further. His eyes flashed.

"Can the Russian," he murmured, "also have discovered the dynamic cartridge? Strange!"

Shaking his head, he studied the article to the end.

"Well?" asked the councillor.

For a time Korf did not reply; then he said slowly: "I do not know what propelling force Suchinow is using for his rocket. One thing is

absolutely sure: if it does not attain the necessary exhaust speed of at least 3000 meters a second, the Russian will not reach the goal. And I think I can correctly state that this performance can be surely attained only by my new machine with liquid fuel. If Suchinow, as is very probable, is operating with solid explosives of the type of the dynamic cartridge, he will not lift his machine above the field of attraction of the earth, or else . . ."

"Or else?"

Stressing each word, Korf completed his statement: "Or else he will pass the limit of the earth's attraction by using up the last supply of energy, but then he will never return."

"A frightful thought!" groaned Heyse.

"Unfortunately a warning would already be too late." Korf took up the newspaper again. "The rocket ascended last night."

"Even if it were not too late, it would not help. Do you really believe that an inventor would seriously consider the warning of his rival? Fancy his letting himself be induced to abandon his enterprise with the goal in sight! Such a warning would also be thought by the public the manoeuver of a rival and would expose you to ridicule without helping anyone. No, it cannot be done at all."

"There still remains the hope that Suchinow has simply released an experimental rocket without occupants. The report certainly does not mention any passengers. But what benefit will astro-physics derive, if a lifeless machine is sent up without an observer, or if the observer does not return alive? Either way, the shot into infinity is an interesting experiment but nothing more, and it will end in a fiasco."

"So much the worse, if the Russian fails!" cried Dr. Heyse. "Then public opinion will be aroused and we shall have no success at all in collecting money for an apparently discredited affair, the hopelessness of which will appear established by this mishap."

"My plan is not hopeless and cannot be discredited by Suchinow's presumable mishap," replied the inventor firmly. "I sincerely beg you, Councillor, to start a public drive for funds. I trust the judgment of the German nation. And now may I be excused? A visitor is waiting for me in the laboratory."

"Incorrigible optimist!" grumbled the councillor, when Korf had gone. "He does not even wonder whether this drive for funds will be sanctioned!"

To Mother Barbara's

APPARENTLY unconcerned, Korf hastened to his laboratory, where Uncle Finkle was already awaiting him impatiently. In one hand the newspaper, in the other his inevitable pipe, Sam ran to meet his brother-in-law, gesticulating and shouting from halfway across the room, so that his voice broke:

"Have you read it? There is a race for the moon! The Russian. . . ."

"Apparently has money!" interrupted Korf. "That is his only advantage. Yet he will get to the moon with money just as little as I shall without it."

"Well, the question of money is not so difficult. Just sell some licenses." With a roguish wink he nudged his friend.

"Licenses?"

"Of course! The simplest thing in the world! Mampe will pay you a pretty penny for the sole right to install saloons on the moon. Don't you think so?"

"It is too bad that apparently there is neither tobacco nor wood on the moon, or I should gladly give you the tobacco pipe monopoly!"

"Thank you very much! Unfortunately I have no use for it. I intend to end my days here on earth. But, joking aside," added Sam sorrowfully, "it is cursedly unpleasant about this rocket. Where did the fellow get it?"

"It is nothing remarkable," answered Korf calmly, "that the very same discovery should be made at the same time by different persons who have no connection. The usual duplicity of events! Besides, this Suchinow came before the public with the project of spatial navigation somewhat ahead of me."

Angrily Sam knocked the ash from his pipe.

"The devil take the entire rocket business, for all I care!" he grumbled. "But if people absolutely have to travel to the moon, then I think it need not be granted to a Russian to be the one who wins the laurels."

"He is not there yet, Uncle!"

"I hope he breaks his neck! I must dissolve my anger, or I shall burst. Come, lad, let us go to Mother Barbara's for a pint. . . ."

"Don't you want to see my experimental model?"

"That would be bad, Gus, very bad! With this wrath inside me? Impossible! The only help is a good drink. Trust old Sam; he knows the things of this earth. When I was just a lad, I often found consolation for my bad lessons by going to Mother Barbara's."

Firmly he took his resisting brother-in-law by the arm and led him away.

In the narrow drinking room of Mother Barbara's inn guests were already sitting, in spite of the early afternoon hour. They were disputing loudly and eagerly about the great event of the trip to the moon.

"The attempt ought to fail," burst out a stout grain merchant, striking the table with his fat hand, so that the glasses clinked. "It's a real shame that a fool of a Russian is getting to the moon ahead of us people of Friedrichshafen. Who built the first Zeppelin? Who flew over to America? We did! And who started this whole business of travelling to the moon? We people of Friedrichshafen. And now are we just going to look on? That is not right, no, it isn't!" Hurriedly he emptied his glass.

"It is terrible, terrible as the devil!" affirmed his neighbor thoughtfully.

"Do you remember," went on the merchant, "what a stir it made when the ZR 3 flew across the ocean, when the whole world looked at us here in Friedrichshafen? And now the moon and the stars would be looking at us, too, if Korf had hurried a little more. Isn't that so?"

"Perhaps Korf sold his invention to the Russian," whispered his neighbor behind his hand, moving a little closer. "We don't know!"

"Don't talk nonsense! Korf giving his business to a foreigner! You don't know him! No, Korf wouldn't do things like that, and now he has invented something quite new, very much better."

"Then why doesn't he build such a ship, eh? Why does he let the Russian fly off and just look on?"

"Well, he put in all his time and ran out of money."

"But look here, this Russian has done it. I don't know, but the whole thing doesn't look good to me."

"Look here," interrupted a third. "This whole Suchinow business is just a swindle! Have you seen the rocket, or has anybody else seen it?"

"Not that I know of!"

"But we could see it flying to the moon. We see the moon all right!"

Busily Mother Barbara ambled around among the tables. She hardly had a chance to stop in her filling the glasses. It suited her nicely. She rejoiced at every event which could excite the people of Friedrichshafen, because excitement causes thirst, and thirst must be quenched. She enjoyed nothing so much as seeing empty pint steins before her guests.

Suddenly the conversation at the head table ceased; two new guests had come in. Inquisitively the people looked at the couple, well known to all Friedrichshafen, persons especially noticeable on this day of days.

"Good day to all of you!" said Uncle Sam jovially. Korf merely nodded absently and took a seat at a table in the partitioned corner behind the buffet.

"Yes, old Sam is still alive, too!" was the greeting of the fat old landlady to the friend of her youth, and she fairly beamed with joy at seeing him again. Without waiting for the order she set two glasses of old Rhine wine on the table and then began a very lively and extensive conversation with Sam. The inquisitive guests at the head table, who were hoping to learn all sorts of things about the moon episode, soon turned away disappointed and bored, beginning again their interrupted dispute, first softly, then louder and louder, with an incessant flow like a mountain torrent. Only an unintelligible confusion of voices, occasionally interrupted by heavy pounding on the table, came through the thick clouds of tobacco smoke.

Korf sat silently in the corner. The newspaper announcement occupied his mind still more than he showed. What kind of energy accumulator did Suchinow possess, that he should venture to despatch the rocket? Would this event harm or help his own plan? Would the rocket really reach the moon? Above all, was there an observer in the machine, and was he still alive? The evening paper would surely bring more news. Besides that, Korf did not think it impossible that the rocket would be visible this evening. As to seeing it with the naked eye, that he certainly considered doubtful.

"A splendid woman, this Mother Barbara!" said Uncle Sam, when the landlady had again turned to the head table, rousing Korf from his revery by the words. "She outlives generations, and her wine is splendid. Here's to your health, lad!"

The Disaster

SAM raised the glass to the level of his eyes, swung it a few times in a circle, sniffed the fragrant liquid, took a little sip, and smacked his lips. His lower jaw trembled like the throat of a tree-frog waiting for a fly. He sniffed again and took another drink. Thus it was a long time before the old *connoisseur* set down the glass again, wiping his mouth and uttering a deep sigh of content from his very soul.

"Now I am more in the mood, Gus; just fire away, what do you think of this new thing? It's probably a swindle, isn't it?"

Korf shrugged his shoulders.

"Who could be interested in exciting the world with such false news? It is rather late in the year for an April fool joke of this kind!"

"Just tell me directly, Gus, why your work is progressing so slowly that someone else could get ahead of you?"

"There are various reasons, Uncle Sam. Two years ago I had already made considerable progress in preparing the rocket. I had put in all my available capital. And then came the catastrophe!"

"That is right. You wrote me once about a great fire. I was then in Bombay, having quite a time with the English. They absolutely wouldn't believe that I had as little to do with the Indian disorders as Mother Barbara with the moon rocket. How about this catastrophe, anyway?"

"Somehow the small supply of my dynamic cartridges seems to have taken fire spontaneously. Maybe there was a short circuit. At any rate, they exploded in my laboratory, luckily when nobody was there. Not much remained of my work, you may well imagine. My assistant, a Hungarian student, came near losing her life in the flames. The reckless girl wanted to rescue the box of construction plans from the fire. It was crazy, with the incessant explosions. I tell you, Uncle, my heart stopped beating when I saw Natalka plunge into the flames. I thought she was lost; I raged at the firemen who refused to follow me into the fire to save Natalka."

Korf remained silent for a while.

"Did you save her?" asked Uncle Sam, much interested.

"I did not find her. How I ever got out of that flaming inferno again is a mystery to me to-day. Later I was told that I was found unconscious

close to the fire. For days I lay between life and death. All my life I shall bear the scars of my burns."

"And Natalka?"

"Fortunately she recognized in time the hopelessness of her mad attempt and plunged into the lake with her clothing all on fire. That saved her. She escaped with the loss of her splendid long hair. I shall never forget this courageous helper, although. . . ."

Korf did not finish the sentence.

"Although? Why, what did she do to you, Gus?"

"Oh, nothing! She remained here a few weeks more and helped me very much in reconstructing the dynamic cartridge. The fire had destroyed all my supply."

"And then?" asked Sam stubbornly.

"And then? Then she asked for her release. I could not keep her."

"So that was the way," said Sam, and he slowly repeated the words, "She asked for her release." He seemed to be thinking of something other than what he said.

"Speak up, lad!" he remarked after a few minutes, while he refilled his pipe. "Isn't it striking that this Natalka went away so suddenly and without cause, only a comparatively short time after the fire?"

"Without cause?" Korf laughed bitterly. "Without cause? Natalka is now living in Berlin as the wife of the apothecary Mertens; maybe right now she is a charming mother!"

"Oh, that's how it is!" said Finkle, whistling through his teeth; he was reflecting. Poor Gus, he thought. Then he said aloud:

"I thought you were going to tell me more about your invention than about the fate of your assistant."

"That can be told in a few words. I had to start again almost at the beginning, and quite by chance I hit on the combination of gases for fuel on which my new model depends. If the airport had not occasionally given me a little help from the surplus funds, I might calmly have buried all my hopes after the fire. Now I have made so much progress that I can build the first practically serviceable space ship as soon as I can get the necessary capital. That is terribly hard in Germany at present."

"And foreign capital?"

"That has been offered me several times."

"Well?"

"Uncle Sam, I would rather destroy my whole invention than let this, too, go to some foreign country. Isn't it enough, in case of a new world war, that the Americans threaten us with our own Zeppelins, that the Japanese rule the seas with our Krupp cannon, and that the French are making steel with our Saar coal? Truly, other countries are equipped with our own best weapons, so that they can attack us at will, if an occasion arises. No, Uncle, my space ship must and will remain a German national affair."

"The trick of this Suchinow is all the worse!"

A Strange Coincidence

SAM again carefully sipped his wine, looking intently at his brother-in-law over the edge of the glass. He remarked quite without any previous connection:

"Do you still correspond with Natalka, that is to say, Mrs. Mertens?"

"She writes to me off and on, telling about her household affairs. The former student seems to have become a model housewife!" replied Korf drily, drawing spiral figures in the ash tray with a match. "Of course I send her a few lines off and on, too; but she never speaks of my cares and plans. Naturally! She has quite different interests now!"

It did not escape Uncle Sam, with what warmth Korf spoke of Natalka and how indifferently of Mrs. Mertens.

Gus, Gus, he thought, you seem to have scorched something besides your skin in that fire! But another idea passed involuntarily through his mind.

"Gus," he began, "do Natalka's letters actually come from Berlin?"

Korf looked up in surprise. "What a strange question!"

"I only thought it somewhat unusual that a Hungarian student should marry a German druggist."

"Well, chemical knowledge may be useful to a druggist's wife," said Korf bitterly, pulling a battered envelope from his pocket. "There, see for yourself! You may perfectly well read the letter, which I got only a few days ago. It is no love letter, such as is kept from profane eyes."

Sam took the letter. "Too bad it isn't, Gus; isn't that so?"

Korf paid no attention to this remark. "Besides, I have met Mertens myself. The young couple visited me once after the wedding."

"He didn't impress you much, this Mertens?"

"Good Lord, he isn't a hunchback!"

Sam carefully read the letter. In firm and almost masculine characters it stated that the writer was very well, that Mr. Mertens was a model husband, that the "Angel" drugstore did a fine business, that this settled existence showed that though their work together in Friedrichshafen was a pleasant memory, woman's place was not in scientific work but in the home, and so forth.

"The only thing missing is some recipes!" mocked Sam.

"Uncle Sam!" cried Korf, reproachful and injured.

"Lad!" said Finkle, rising gravely. "I know and understand; this Natalka has made a fool of you. Everybody has his youthful fancies, and no one can say anything against them. But Gus, a woman who writes such silly meaningless letters—why, Gus, such a woman is not worth one hour's thoughts from a man like August Korf. I must say so, Gus! And if to rescue the honor of your adored one you think you have to take a pistol shot at old Sam, well, please go ahead!"

With a mighty swing of his arm he threw the letters on the table, striking the paper with the fist which firmly held his pipe, so that a rain of ashes and burning tobacco poured over the table. He must have been greatly excited to subject one of his beloved pipes to such an unaffectionate treatment.

Korf shuddered; then he said in an aggrieved tone: "I cannot contradict you, Uncle. If I did not know Natalka's handwriting so well, I could not possibly believe, good heavens, that Mrs. Mertens and my—my assistant were one and the same person!"

Dissatisfied, Sam cleaned up the table, testing the mishandled pipe and knocking the ashes from the letter. The postage stamp had fallen from the envelope, and he tried to stick it on again—mechanically, as though trying to remove all signs of his outburst of anger.

Suddenly he stopped, held the envelope under the light, examined it with first one eye and then the other, and shook his head thoughtfully. On the place where the stamp had been stuck was written in pencil "30/8".

"Strange," murmured Sam, "to write the date of the letter under the stamp!" Then he took up the letter again. It was dated August 30, which agreed with the pencilled date. The Berlin postmark had the same date.

Then his wrinkled face lighted up; a sudden idea seemed to brighten him, and contentedly he again surveyed his wine glass.

Well—the letter was written by Natalka and posted by Mrs. Mertens in Berlin on August thirtieth. But. . . .

He put the envelope into his pocket, on the reverse of which was the sender's address, returned the letter, and said, ignoring what had just occurred:

"Then money is what you lack! I shall just see about that a little. Old Sam knows many people. Who knows, perhaps I can be helpful to you in this respect. Tomorrow I must be off to the Turkish Consulate in Berlin, and I shall keep the matter in mind.—Mother Barbara, bring me another of the same!"

The pump began to work—The candle flickered and went out. The bell sounded fainter and fainter though the clapper kept on striking.

A Sleepless Night

IN the streets and alleys of the usually very quiet little city on Lake Constance it was lively the next night. When darkness set in, the people poured out to the lake in crowds. The entire city, to the last man, seemed to come out. They crowded about the boats which were for hire, the owners of

which were doing splendid business. Recognizing the demand, they made a special increase beyond the ordinary rental fee. As far as one could see in the darkness, there were canoes, rowboats, and any kind of thing that would float on the water. With telescopes and opera glasses the people unceasingly scanned the sky with an attention such as had hardly likely ever been given the old moon in this district before.

The evening papers had confirmed the sending of the rocket, and no dweller in Friedrichshafen was willing to let this event escape him, though opinions regarding visibility and invisiblity were very divided. On this evening many saw perhaps for the first time that most of the stars, like the sun, rise in the east, climbing higher and higher in the firmament, to sink again to the western horizon. Many noticed or learned, to their astonishment, that the pole star, on the contrary, seems to stand still, while the entire starry heaven revolves around it.

But when the hours passed and nothing at all sensational occurred, no arc of fire in the sky, no glowing, speeding shot, no explosion on the moon, then gradually the older persons began to go home disappointed, others followed, and all at once commenced the general migration back to the city, though morning was still far off. Only the more stubborn ones held out until the grey of morning, until the rising sun colored the eastern sky and extinguished all the splendor of the stars.

On the next morning the papers brought reports columns in length. All the reports, including those from other countries, showed a certain disappointment that nothing could be observed; yet there was scarcely any doubt that the shot had actually taken place. A leading Berlin paper printed the description by its Roumanian correspondent. To be sure, no one had actually seen the shot, but in the night in question, soon after nine o'clock, the dwellers in the vicinity of Calimanesti had waked in fright at a loud thundering crackling sound like machine gun firing. In great excitement the Roumanian mountaineers, who could not understand the frightful noise, had fled down the valley. The cattle had become unmanageable, horses and oxen had broken loose, increasing the general confusion, added to which was the incessant howling of the dogs, while the mountain beasts, heedless of men and dogs, had fled through the villages in wild terror.

The thundering had also been heard in the great hotels of Ramnicul Valcea, and some of the guests claimed that they had seen a dazzling light over the mountains to the northeast.

Most of the observatories which had been asked for information about their observations and opinions assumed a very cautious and reticent position.

The Babelsberg Observatory, Berlin, wrote as follows:

"Until we are informed regarding the dimensions, velocity, and direction of flight, we can form no opinion regarding the possible visibility of the rocket. It is, however, certainly striking that up to now the rocket has not been perceived by any observatory in the world."

The Greenwich Observatory, reporting to the *Daily News*, offered rather more hope:

". . . . Still it is possible that the rocket is illuminated insufficiently or not at all, for which reason it can only be seen when it emerges from the shadow of the earth. We can make no prediction when that will occur, since we have no basis for calculation."

Even the following night brought no certainty, since a thick covering of clouds had formed over the entire Western Europe, and the commencing autumn mist alone was enough to make observations extremely difficult.

Soon such strong doubts had public expression that no one dared to look up at the sky any more, for fear of being mocked as a "rocket-gazer".

This development of the matter was not at all pleasant for Korf. Even if he himself, on a logical basis, believed that the shot had succeeded, it was fatal for the public to think itself made fun of. What effect would this have on his collection of funds, now just ready to start? The public might after all pass over a failure, but it would never pardon having been fooled. Doubtless the inevitable inclination to generalization would produce at least a very reserved frame of mind as regards the question of spatial navigation.

A bad omen for the fate of the national collection!

Korf grew very angry.

"This botcher!" he growled. "Apparently the machine was badly made and has come to grief. It would have been better if he had kept quiet about his shot into infinity. Public opinion is quickly destroyed!"

It did not occur to Korf that he was really heartily wishing success to his dangerous rival. He honestly hoped that the rocket would still be discovered in its path to the moon.

CHAPTER IV

The Riddle

FROM the Uhlandstrasse station of the Berlin subway a man slowly climbed the stairs to the open air. He looked about in hesitation and then walked over to a policeman.

"The *Angel* drugstore?" answered the latter to his question. "That has been closed for six months, and the building is being made over to a moving picture theatre."

The inquirer gave polite thanks for the information. Pleased, as though the policeman had given him very satisfactory news, he continued up Uhlandstrasse, carefully examining the white tablets with the name of the streets, and turned into a side street. Stopping before a high, dreary lodging house, he drew from between the tobacco pipes and pouches

in his pocket a crumpled envelope, comparing the address with the number of the house.

"Well, just wait, my dear Mrs. Mertens!" he said to himself with a grin. "You will be in our hands, after all!"

Then he entered the house and stamped up the grey creaking stairs. Each story contained three dwellings, and accordingly old Sam had to study several dozen nameplates of occupants and visiting cards of sub-letters, until finally on the fourth floor at the right he saw the name Mertens shining on a polished brass plate.

For a long time nobody answered his ringing. He pressed the button a second and a third time, when he at last heard shuffling steps in the corridor. The door, secured by a safety chain, opened barely a hand's breadth.

"Who is there?" cried a thin squeaky voice, apparently belonging to a woman and startling Sam by its tone. He never could endure talking with invisible persons.

"Just open the door, my good Mrs. Mertens, I am not a burglar," he said in the friendliest tone possible to him in his sudden excitement.

An ill-smelling vapor of sour milk and steamed sauerkraut came from the narrow opening.

"What do you want?" asked the voice behind the door.

"I shall explain it exactly, as soon as you have opened the door, Mrs. Mertens!"

"But I am not Mrs. Mertens. They moved out long ago."

"Is that so?" said Sam in surprise. "Then why is there a plate on the door with the name of Mertens?"

"Are you from the housing commissioner?" said the voice, in which there now sounded a blending of mistrust and worry.

"Do not be alarmed, my good woman! Please tell me where the Mertens live now, and I shall not bother you any more."

"Ask the porter!"

Samuel Finkle was glad to follow this rude but practical direction, and luckily found in the porter a creature of flesh and blood—very much flesh, indeed.

"Well, the Mertens!" said he. "Yes, the Mertens! Just keep your fingers away, my dear sir. Mr. Mertens is not going to keep his eyes shut much longer. I advise you to stay away!"

Uncle Sam could make no sense of the stuff the man was saying, yet he congratulated himself on having found so talkative a person. Here he could count on learning more than from the nivisible spirit on the fourth floor.

"I know you mean well by me, porter," said he, "but will you please be so kind as to express yourself more plainly. I do not understand you."

Then the porter laughed so loudly that it reechoed.

"Oh, don't try to fool me that way! Of course a person does not hang his dirty linen in the market place. But you don't need to hide things from me; I can keep quiet. I've seen plenty of fellows sneaking up the stairs, when Mertens was over at the drugstore."

The porter grinned in a greasy, ambiguous way, perfectly comprehensible to Sam.

"Fortunately they moved out before we had to get after them with the authorities. This is a respectable house. Of course we put up with things and sometimes shut both eyes a bit. But she went too far, till it even caught the attention of the tax collector on the first floor, and anyway her shamelessness was getting too much for me."

"Tell me, how did this Mrs. Mertens really look?" asked Finkle thoughtfully. The porter eyed him from top to toe. There was a threatening tone in his words:

"See here, are you making a fool of me?"

"Not at all; I really do not know Mrs. Mertens. I just wanted—well, I am supposed to give her greetings from an old friend."

"So that's it—from a friend! I really might have thought that you were not the lucky man. She used to favor younger cavaliers."

Uncle Sam was getting ashamed of the unworthy rôle which, against his will he had forced on his young friend. Still, wasn't it somewhat justified? Hadn't there doubtless been tender relations between Korf and Natalka?

"How does she look?" went on the talkative porter. "Good Heavens, she's a pretty thing, one must admit; and," he added pleasantly, "she has legs, such legs that it is no wonder the men run after her. Oh, how does she look? She has short black hair, a white skin, and—Heavens, how shall I express it!—she looks like a vaudeville actress or something of the kind. The devil take the women!"

Uncle Sam was getting noticeably uncertain in mind.

"Short black hair, you say? About how old is she?"

"Much too young for you, you may depend on that!"

"And do you know her first name?" Sam went on politely, though he felt a desire to give the impertinent man a good box on the ear.

"You have me there! She has a lot of names, a different one for everybody."

"And where did you say the Mertens were living now?"

"Shortly after they had sold the drugstore, it was the turn of the dwelling. There is a lot of business in that nowadays. It is hard to pay for lodgings, especially in a pretty, roomy building, if a person to whom you let a room moves away. After that they went to Vienna and now, so far as I know, they are in Budapest. I recall, that is right. Mertens recently wrote me about the coal which was still in his cellar, and he mentioned that his wife was again appearing at the—the—what do you call it?—the Or. . ."

"The Orpheum, don't you mean?" put in Uncle Sam, who had a good knowledge of the world. "And the address? Have you the letter still?"

The porter opened a drawer of his desk and searched in a regular mountain of papers, while Sam strove to bring his ideas to order. Had his Gus been really attracted to such a woman—his Gus, whom he loved as a father would his son. To be sure, it often happens that intellectually gifted, eminent men seem smitten with blindness when women are in question. Yet he would certainly have credited his brother-in-law with a better understanding of mankind.

"Here is the letter!" The porter roused him from his meditation and slowly spelled out the words:

"Budapest, Szabolcs Utca number 54—oh, read it yourself! I don't know Hungarian."

Sam readily believed that and wrote the address in his notebook.

"One more thing: have you any idea what Mrs. Mertens' maiden name was?"

"Yes, I know very well, for many of her cavaliers knew her only by her maiden name and used to ask whether a Miss Weiss did not live here."

Old Sam's knees shook. Weisz, the Hungarian name Weisz, which the porter took for the German name Weiss, was the name August Korf had given him, the name of Natalka.

Thanking the porter, he gave him half a mark, because he was always accustomed to be sparing in the way of tips, and set out for his hotel.

Finkle Scores

HIS entire artfully formed hypothesis was trembling in its foundation. He had set himself up as a detective, luckily only to himself. He was getting confused. What had he expected? What was more natural than that Mrs. Mertens used to have the maiden name Weisz? Why did this person who was formerly assistant to his brother-in-law and afterward married to the druggist Mertens of Berlin concern him? Why did he think himself pledged to shield this woman?

Truly, this Mrs. Mertens was not worthy of occupying the thoughts of Samuel Finkle. But—was he really shielding Mrs. Mertens? It was in fact only Natalka, whom Gus still cared for. His Gus, whom he wished to free from the unexpressed reproach of having been attracted by an unworthy and unintelligent woman.

Yet Natalka and this Mrs. Mertens were one and the same person!

In an ill humor he pushed into the crowded subway car, worked his way among sharp hatpins and glowing cigarettes, and finally came to a stop in the crowd, firmly wedged between two tall gesticulating natives of Berlin, who were chattering away over his head. This disturbed Sam in his already hopelessly confused reflections. Mechanically he reached in his pocket, to protect his pipes from being crushed, and in so doing felt Natalka's letter between his fingers.

Certainly there was something wrong about this letter. But what?

Anxiously he held fast to this idea and tried to free it from the chaos into which all his logic was threatening to sink. "Letter—letter," he murmured to himself, in order not to forget again that connected with this letter there was something wrong, about which he had to reflect.

At Nollendorf Square he had had enough of the crowd, and he worked his way out of the car. With amazed smiles those in the station watched the slender little man who kept saying to himself "Letter, letter" very audibly while rushing away as though something hounded him on.

In exhaustion Sam threw himself on a bench. He began to review his thoughts, and again a light came to him.

"If Mrs. Mertens is identical with Natalka," he said aloud to himself, in the manner of an examiner to a candidate, "why doesn't she write to Korf from Budapest? Why does she choose this unusual detour by way of Berlin? Why does she tell about a drugstore which long since has ceased to exist? Why write these letters ahead of time at all? And who posts them in Berlin on exactly the days which are noted on the sealed envelopes? Can she have someone in her confidence here, to look after these letters?"

Again he looked at the postmark. It was that of the postoffice in Uhlandstrasse.

Perhaps it was this porter, who knew so much and whose sense of honor and propriety had required some impetus from the tax collector on the first floor to reach an ordinary and natural indignation! How could he have forgotten to make inquiries about this?

No sooner thought than done. He quickly set out on the return trip. This time he did not take the subway, the unpleasant mode of travel which confused all his ideas, going on foot instead.

In astonishment the porter beheld his visitor reappear. His reception was not excessively friendly; the stingy half-mark piece had perceptibly lowered his opinion of Mr. Finkle.

"Good Lord! What do you want this time?"

"I quite forgot to tell you my name, porter," said old Sam, determined to go the limit, "my name is August Korf."

"From Friedrichshafen?" blurted out the other in surprise.

"Quite right, porter, from Friedrichshafen. As you know, of course!" This was the man who posted Mrs. Mertens' letters. Calmly and confidently Sam continued: "You still have a few more letters from Mrs. Mertens to me. You may save the postage. I'll just take them with me."

"But I am supposed to post the letters only on certain days! Besides, how do I know whether you are really Mr. Korf?"

"How else should I know about the letters, my good man? Besides, if you will not give me the letters, the matter is not so important but that you may put them in the stove, for all I care!" With that Uncle Sam turned to go.

"Are you perhaps tired of the Mertens woman?" cried the porter maliciously. "If you tell me your exact address and what you say agrees with the address of the letters, then for Heaven's sake take the letters away! I shall be glad to get rid of them!"

Slowly Finkle turned around, named the address of his Friedrichshafen friend in a careless fashion, and then received a little package, which he stowed away in his breast pocket.

His good humor was restored as he left the Uhlandstrasse lodging house, never to see it again.

The Dot In The Heavens

IN the afternoon, on Potsdam Square, there was an apparently hopeless confusion of carriages, automobiles, buses, and street cars. Noise, noise, and still more noise! From the Potsdam station sounded the whistles of entering locomotives, but they could not compete with the shrill yells of the newsboys:

"*Berlinger Zeitung,* afternoon edition—*Tageblatt*—*Börsencourier*—*Berliner Zeitung.*

Uncle Sam held his hands to his ears as he crossed the busy square and turned into Leipziger Strasse.

"This accursed screaming!" he grumbled. "As if there wasn't enough noise without it, on that windy corner!"

For a moment the calls of the newsboys were hushed. Apparently they were receiving new supplies of papers. But then they resounded again, louder than before.

"Extra, telegraphic despatch, *Berliner Zeitung!* Moon mystery solved! Discovery of rocket!"

Uncle Sam began to listen. The rocket discovered? In his zealous performance as an amateur detective he had entirely lost sight of the final object of his investigations, the rocket. Hastily he purchased one of these papers, still damp from the press, and scanned it quickly.

"The Moon Rocket Found!"

"ACCORDING to an announcement of the Lick Observatory in California, at about 5 A. M. on September 9 (at noon of that day, by our time) a dot of light, with a bluish glow, was observed in the eastern sky, moving with great speed toward the moon. At the moment of observation it was about 200,000 kilometers from the earth.

"This is doubtless the Suchinow rocket, evidently exhibiting a phase of illumination as the moon does, at present appearing in the first quarter. This demonstrates that the rocket has no illumination of its own and has only become visible through the reflection of the sun's rays. Thus is also explained the previous failure in locating the rocket, which apparently emerged from the shadow of the earth only after thirty-five hours from the time of starting.

"Since the Lick observation is dated about forty hours after the start, and since in this time the rocket had covered half of the entire distance to the moon, the arrival at the moon might be calculated for tomorrow morning at about five o'clock (Central European Time). It is to be hoped that the sky will be sufficiently clear for the observation of this sensational event from our Babelsberg Observatory likewise.

"In order to spare our readers a disappointment we warn them beforehand that there is of course no possibility of witnessing this event with the naked eye. Even in the gigantic telescope of the Lick Observatory, with an enlargement of more than a thousand times, the rocket appeared only as a tiny, hardly perceptible dot of light. Accordingly it will be rather pointless to look at the sky during the night with field glasses and opera glasses."

Uncle Sam slowly and carefully folded up the sheet and put it in his pocket. Then he went to a café to refresh himself, mind and body, for further activity.

It was remarkable—eighty hours from the earth to the moon! This was exactly the time required by the Zeppelin sent across the Atlantic in its voyage from Friedrichshafen to Lakehurst.

Was there perchance some one up there in that fragile object, about to visit the moon by morning?

Then his thoughts returned to the porter in Uhlandstrasse. What a shameless fellow! Yet Sam bore him no ill will, since he had furnished valuable information. Now he knew that—well, what did he really know? That Mrs. Mertens was Natalka, and Natalka Mrs. Mertens? Was the matter not actually made very involved merely through this "explanation"?

He took out the package of letters. Eight envelopes, all bearing Korf's address in the familiar strong handwriting, all identical, even to the heavy line under the word "Friederichshafen," which was exactly repeated in width and direction. There could no longer be any doubt: all the letters had been written at the same time with the same ink.

"Fine doings!" said Uncle Sam to himself. "Writing a dozen letters at once! No wonder that nothing brilliant results. Still, it indicates energy and persistence."

Then he studied the dates written in the corners where the stamps would be placed. He was interested to note how long a time Natalka had intended these tender attentions to his Gus.

"Great! This woman actually reasons! Of course she could not break off the correspondence suddenly. That would have attracted attention. Accordingly she lets the intervals become greater and greater, and the correspondence gradually goes to sleep. Well! This Natalka is not so foolish as might be expected from the contents of the letters."

He had a great desire to open the envelopes. But he did not venture to intrude into the secrets of his brother-in-law. Korf might not like that.

"After all, I can well imagine what there is to read in them," Sam comforted himself. Then he continued with his plans. For a long time he reflected, formed schemes and rejected them, planned like the keenest criminologist, and by the time he left the café had a decision firmly settled.

First he went to a telegraph office, where he sent two telegrams to Budapest and one to Mr. Suchinow, Transcosmos, Bucharest.

After he had procured a berth on a sleeper to Vienna, he went to his hotel, told the amazed clerk that he did not require the room he had engaged, and repacked his suitcase.

Whistling merrily, he went to the Silesian railroad station.

CHAPTER V

A Financier's Worries

DOUBTLESS everyone who has visited Bucharest, that city of many bridges on the Dimbovita River, knows the Calei Victoria, the great street for loafing and afternoon meetings, as well as the world-famous confectionery store of Riegeler.

Bucharest, the Calei Victoria, and Riegeler are ideas just as inseparable as Munich, the October Festival, and the Hofbräu.

At Riegeler's there is always a swarm of people, no matter at what time of day you enter the long room. Here young ladies eat sundaes; here high-collared bankers sit, having left the near-by stock exchange for a soda; here the talkative middle-aged ladies, who seem international and are to be found all over the world, knit countless stockings and demolish mountains of cakes and sugared almonds; here connoisseurs of all nations revel in the symphonies of refined sweets, the secrets of which do not seem to escape from this confectionery store.

In Roumania everyone is fond of nibbling, even more than elsewhere, and it seems very natural for even the countryman to stay to look at these splendors. Carefully dressed, cane in hand, they sit by the hour at the little marble tables and reverently enjoy the latest Riegeler collation.

In this place, in the late afternoon of September tenth, we find Romano Vacarescu in eager conversation with the general director of the Transcosmos Stock Company, Dimitri Suchinow.

The conversation seemed to be rather one-sided. The corpulent little financier held Suchinow firmly by a coat-button, pushed him down on a chair, and spoke eagerly to him. Suchinow hardly listened; he was in a hurry. He wished to see whether there was any more correspondence in his new office in the Calei Victoria, and then he meant to go out to the observatory. The air today was clear and transparent, offering a perfect observation, which today was the more important, because during the night the rocket must enter the sphere of attraction of the moon.

He was excited and nervous, feeling little desire to listen to the lamentations of the man who cared less about the fate of the rocket than about the rise or fall of his stocks.

"One more thing, Monsieur Suchinow! Is the undertaking to be described now as halfway to success? You know, I have signed the majority of the Transcosmos stock. The last three days of uncertainty have so affected its market value that. . ."

"Good Lord, yes!" cried Suchinow, to prevent further details. "To be sure, the rocket shows a considerably smaller velocity than I had first expected."

"Consequently. . . . ?"

"Merely a longer time for the trip, if . . . ." He seemed to be seeking suitable words.

"If?" insisted Vacarescu in mingled anxiety and impatience. He moved nearer, in order not to miss a word of the inventor's explanation.

"If the rocket does not get too near the moon. But Skoryna will take care."

"But if he does get too near, what then?"

The financier bent over, close to the face of Suchinow, as though he would breathe in the reply from his lips.

"Do you suppose it possible for the rocket to strike the moon?"

"By no means. It will only be more difficult and will take time to get away from the moon again!" was the cautious answer.

"What is the percentage of probability of the rocket's safe return?"

"Are you going to calculate the future of your stocks accordingly?" said Suchinow in a jesting manner which excited Vacarescu.

"You certainly have nothing to lose by it. All you can do is gain. But my money, my dear fellow, may stick to the moon overnight. I tell you, as soon as the stock is at par, I shall let go. I have had enough of the 'shot into infinity,' and I should not care to go through these past days again." Vacarescu cried this loudly and snorted with rage.

"Calm yourself, sir! We are not on the stock exchange. Besides, you are mistaken in your apportioning of the risks. Don't I hazard losing far more than you?" said Suchinow sharply. There was a deep vertical furrow on his brow.

"Indeed!" laughed Vacarescu scornfully.

"In case of a catastrophe my whole life's work is destroyed, and—Skoryna! You forget that a human life is at stake."

"Which costs me twenty thousand pounds. Is that nothing?"

"We will not quarrel, Monsieur Vacarescu, especially now, when we may have every hope that the expedition will end successfully. Good bye, sir!"

Quickly Suchinow escaped from the fat man. He made his way among the marble tables out into the open air and hurried across the boulevard without looking around. Vacarescu, with his financial worries, was getting tiresome. There was in truth more at stake than a few thousand pounds.

Uncertainty

THE flight of the rocket did not satisfy Suchinow. To be sure, the start had taken place smoothly. Under the backward pressure of the rapidly successive explosions of the energy cartridges the torpedo-shaped space-ship had risen, its speed becom-

ing greater and greater, until after just a minute it disappeared in the clouds.

All this had taken place according to the program. Since the initial acceleration was not excessive, it could not have hurt Skoryna much. But the failure of the lighting system caused Suchinow to reflect. Apparently Skoryna had not succeeded in eliminating the trouble. And why had he sent to earth none of the radio messages for which Suchinow had waited in nerve-wracking tension? Now the rocket had long since left the reception field of the most powerful stations on earth, not to speak of the impossibility for the tiny sender on the rocket reaching back to earth. Yet in the first few hours after starting Skoryna could have sent word, which would have meant certainty as to the outcome of the shot. This fearful uncertainty of the first days had been ruinous to Suchinow's nerves.

Disappointment, as well as the distrust of the whole civilized world, did not matter to him. But what of this observation by the Lick telescope, from which could be calculated for the first half of the total distance an average speed of only 1,400 meters a second? According to his own figures the rocket would have needed to develop an average speed of 2,400 meters. With this the crossing of the equilibrium point between the earth and the moon, where gravity does not exist, would be guaranteed at about 500 meters a second. Then the free fall to the moon would take place in a weak hyperbola, and the risk of being held by the moon in a closed ellipse would be banished.

Now, however, not much more than half of the necessary speed had been produced. The fuel provided for the ascent would certainly not suffice to carry the rocket past the limit of attraction of the earth. To what extent would Skoryna be forced to draw on the reserve supply, and would the remainder of the dynamic cartridges still suffice to pass the limit of gravity again on the return trip, to break the free fall to earth sufficiently, and to make possible a safe landing?

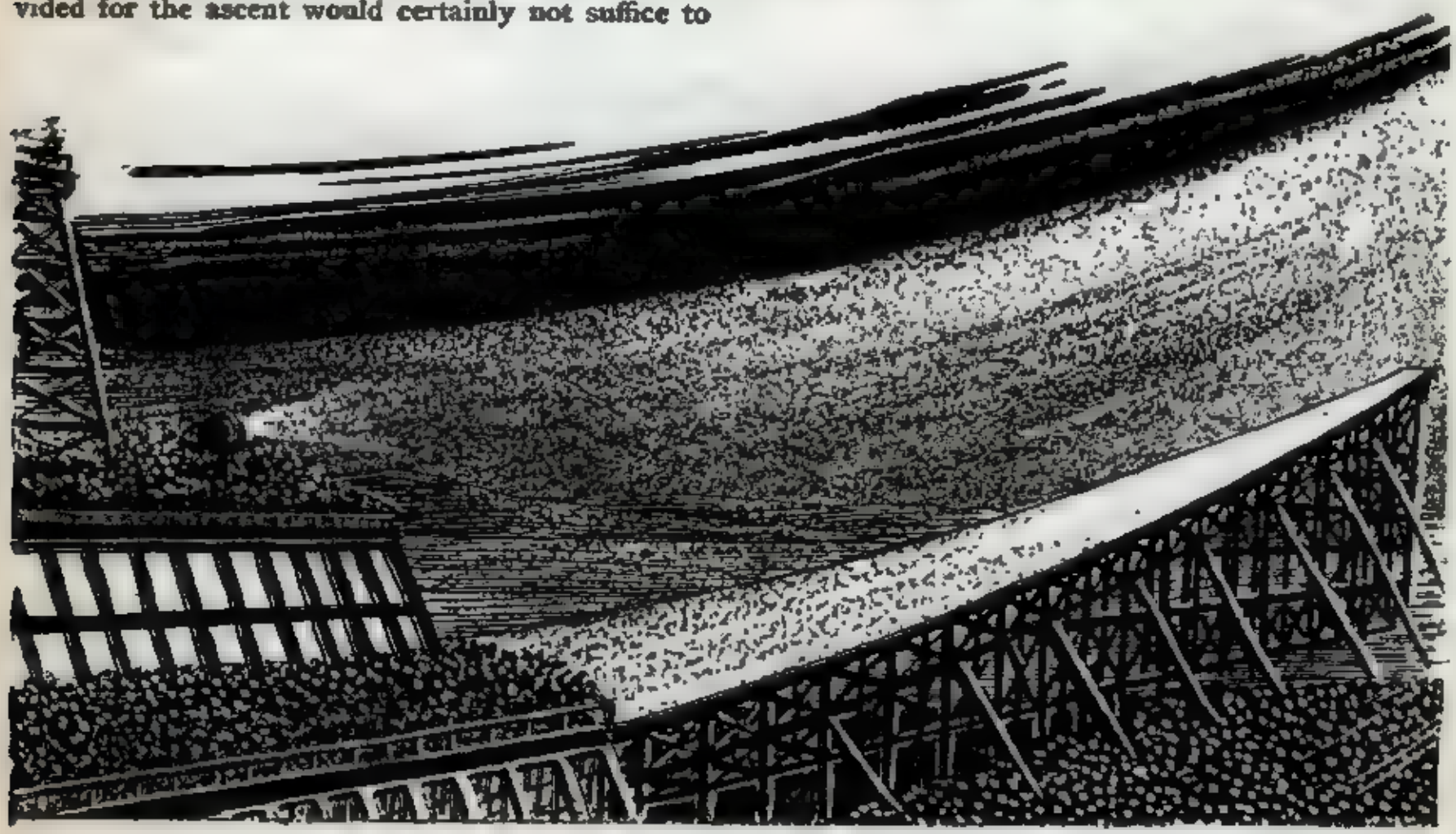
Suchinow trembled at the thought that Skoryna might overlook this tremendous danger or rashly cast discretion to the winds.

In that case there would be only two possibilities: either the rocket on the return trip would escape from the moon's field of gravity with its last energy, which would so lessen the supply of cartridges that it would fall to the earth, without sufficient braking energy, and would be smashed to bits, or else it would remain bound to the moon, circling about it as a satellite, eternally . . . .

What then?

The rocket contained food, in the form of concentrated pellets, which would suffice for months. There was also ample provision for oxygen. In the meantime a second space ship could be built to come to the rescue. But in the solitude of space, without communication with the earth, in uncertainty as to his fate, was it not absolutely certain that Skoryna would become insane? And would Vacarescu risk any more money on a second model? The Transsylvania Company was out of the question, after the founding of the Transcosmos Company. After all, would not the second rocket meet the same fate as the first?

Suchinow's blood boiled. He must now not lose



Quicker and ever quicker the ship rushed ahead. After half a second it was taking the incline. It raced up the slope with a speed many times that of an express train. In ten seconds it was past the kilometer mark. It was an over-

his calm; he'd just have to keep clear headed! Good Heavens, he simply must not break down! If only he had not yielded to Skoryna's impetuous urgings and had sent instead a model without a passenger!

Yet his fears were perhaps in vain. Surely Skoryna would have recognized his position and would avoid being entrapped by the moon. At a proper distance he could circle about it as often as he pleased. That would not require any energy or at most only a couple of discharges for steering purposes, not, of course, significant in amount. Skoryna would doubtless recognize and carry out the proper course.

Suchinow sought to calm himself with these and similar thoughts, but he was not master of his tormenting worries.

Quickly he crossed the rooms of his office on the Calei Victoria, noisy with typewriters and still smelling of paint and varnish. He locked himself in his private office.

Here or in the observatory he had spent the last few days and nights as well, since he could not sleep. In exhaustion he sank into the big armchair before the desk. He had several hours free, since it was at ten o'clock he was expected at the observatory.

Mechanically he glanced at the tapestries on the walls, at the pretty renaissance clock, and the huge globe in the corner. Then his head sank down, and imperious nature compelled him to sleep.

He was roused by a gentle knock at the door.

"What is it?"

"A telegram, sir."

Carelessly he opened the envelope and read the despatch. As if in sudden terror he started up, tore into bits the innocent little paper which seemed to have brought him unpleasant news, and strode up and down the office on the thick rug which muffled

whelming sight. A sea of yellowish light flooded the densely packed multitude. An outburst of thunderous applause followed the space ship. As if lifted by spirit hands, the fiery figure sped obliquely upward in its mad course.

his steps.

"Damnation, there is something wrong there!" he muttered through his clenched teeth. "That is the last straw!"

With a groan he threw himself again upon the chair, picked the scraps of the telegram out of the wastebasket, and reached for his timetable.

CHAPTER VI

Discoveries

WHEN Samuel Finkle reached Budapest, he took one of the cabs which stood in a very long row at the station and drove to the hotel in which he had engaged a room by telegraph.

He would greatly have preferred taking a stroll by the Danube, to refresh himself after the long trip. Then he would drink a glass of Tokay in one of the café gardens near the river promenade and look across the wide blue stream, whose water reflects the fortress of Alt-Ofen and the charming villas of the Budapest magnates, rising from a sea of green. He would have taken pleasure in the vivid striking elegance of the piquant Hungarian women, who in the afternoon crowd the river district.

Uncle Sam had no time for that. There was so much to be done today, and at the stroke of six all had to be ready.

"Room forty-six!" said the German-speaking clerk of the hotel. The elevator took Sam to the second floor, while a bellboy brought his suitcase and showed him the room.

Uncle Sam subjected his lodging to a careful and detailed examination, doubtless such as he had never before given a hotel room. A small living room with an adjoining bedroom made up the "apartment" which he had engaged by telegram. The bed was miserable, the room telephone did not work, and the light switches were so badly placed that the light could not be put out from the bed. These were matters which ordinarily would have very properly displeased old Sam and have caused him to subject the price of the room to a revision.

This time, however, his demands seemed to be in other directions. First of all he was interested in the communication door between living room and bedroom, which was covered by a thick heavy curtain. The door could stand open without its being noticed from the living room.

The bedroom had no other entrance and could be reached only through the living room. Then he tested the electric light. The chandelier in the living room had four bulbs, which were controlled by a rotary switch and could be lighted singly or all together. Since only three of the bulbs were sound, however, he removed the one in the reading lamp in the bedroom and screwed it into the chandelier in place of the defective bulb.

Blinking he tried the illumination in the now fully lighted room, the bright walls of which diffused the light. After he had measured the room by pacing it, he turned off the light again and left the hotel, evidently satisfied by his investigations.

He did not now turn to the river promenade but firmly repressed his inclination for strolling and entered a small photographic store on the square.

"Have you an *Ermanox?*" he asked the young salesman, who did not understand German and looked at him in surprise.

"Have you an *Ermanox* camera?" he asked repeatedly, noticing soon that the young man recognized the name *Ermanox*. Since Sam could make nothing of the Hungarian answer, he ran the gamut of his linguistic knowledge:

"Do you speak English—parla italiano—parlez-vous français—sti rumineste?"

Immediately the salesman began to speak a stumbling high school French and explained that unfortunately he did not carry Ernemann apparatus but that he could furnish a number of other first class makes.

"But I need a camera with very great illumination!" said Sam. "If possible, I want one with the opening 1:2!" This the man could not furnish.

He tried his luck in several stores. Finally he found a large specialty store where he obtained the desired Ernemann *Ermanox*. He also bought some ultra-rapid plates, which he at once had placed in the holders.

Arriving again in the hotel, he so set up the camera that the lens commanded the living room, in case the curtain was pushed aside a little.

Then he hastened down stairs and instructed the porter to take to his living room visitors who asked for Mr. Suchinow or Mrs. Mertens.

"I have a little errand to do and shall be back shortly. Then can be patient for a short time and wait for me in the living room," he said carelessly, as the porter noted down the names, and then walked out of the front door.

Once outside, he circled around the hotel, returned to his room by way of the restaurant and the back stairs, switched on all the lights in the living room, darkened the bedroom, and drew the curtain across the doorway. Then he sat down in the dark bedroom beside the *Ermanox* camera and waited.

It was shortly before six o'clock. There was a crafty smile on his wrinkled face. "I hope they do come!" he thought, yawning. His old habit led him to put his hand in his pocket and draw out a half colored meerschaum pipe. He only came to realization as he was just in the act of striking a match. "Don't be foolish, Sam!" he said to himself and laid the pipe down at a distance, in order not to be tempted again.

Finkle's patience was given a hard test. For half an hour he sat in the dark, without his pipe, terribly bored. Then steps approached outside in the corridor. The door of the living room opened.

"If you please, madam, will you wait here a little while," said someone in French. Clothing rustled, and such a cloud of perfume came to Sam's nostrils that he had trouble in suppressing a sneeze. Tripping footsteps were audible, then a gentle sigh and the squeaking of the sofa springs.

Father and Daughter

SAM cautiously peeped through the curtain.

"Good Lord!" escaped him, luckily not aloud. The porter in Uhlandstrasse had not said too much. This lady, dressed in the latest style of close fitting grey autumn dress, sitting on the sofa and thoughtfully tapping the floor with the points of her patent leather shoes, was certainly a pretty little thing. Very black hair, cut short but very thick and combed straight back from her forehead, set off a white girlish face, the softness of which was sharply contrasted with the sensuous and rather pouting lips and the perfectly formed neck, which suggested a slim but very shapely figure. She had crossed her legs, and her dress, which had slipped up to her knee, revealed shapely slender legs, in chiffon stockings, the lines of which quite confused old Sam's thoughts. Of course the lady believed herself alone and unobserved, and he was getting somewhat ashamed of his unworthy position as a spy.

Was it Natalka? She certainly did not look like a woman who understood science. Sam cautiously snapped the camera. A slight click, which was smothered by the ticking of the clock, and the first step toward proof was secured. Quickly and quietly he changed the plate holder.

The lady opened her red morocco case and lighted a cigarette, the fine blue clouds of which penetrated the curtain and awakened in Sam a new desire for his pipe. "A detective has a hard time!" he reflected sorrowfully, picking up his pipe to have at least a "cold smoke."

Time passed, and the lady seemed to be getting impatient. Sam saw her take a paper from her pocketbook and read it. "Aha!" he thought with a grin. "My telegram!"

Suddenly the door was hurriedly opened, the lady uttered a soft cry, and a tall thin man entered quickly, his face strangely dotted with green. "He seems to have been gassed!" murmured Sam, remembering this type of injury at the time of the world war. "Perhaps the energy cartridges have poisoned him!"

Attentively he listened to the lively conversation which took place in the next room. Unfortunately, they were speaking a language which he did not understand, apparently Russian. That was fatal, and he tried to read some meaning in the gestures and acts of his guests.

Suchinow, for it was certainly he, hastily kissed the lady on the forehead; he seemed to be in an extremely bad temper, and his voice sounded harsh and even imperious. Mrs. Mertens twittered like a swallow, pouted, and several times pointed her finger at her head. Then they both spoke at the same time, as though trying to drown out the other's words, and finally Mrs. Mertens held the telegram before the man's eyes.

"Now's the time!" thought Uncle Sam, having his camera in readiness and snapping it just as the two quarrellers turned their faces in his direction. To be more certain, he took a second picture. Then he moved the tripod aside, put in his pocket the holders of the three exposed plates, and peeped again through the curtain.

Suchinow was just holding the perplexing telegram in his hand and reading it!

"Expect me Friday evening six sharp Imperial Hotel Budapest. Suchinow."

Samuel Finkle came near uttering a cry of joy. Suchinow, doubtless because of the excitement caused by the telegram, was now speaking French, and both conversed in this tongue, so that now Sam was able to understand everything.

"And you believed that, you goose!"

"Oho, what you lack in politeness!" said Sam to himself with a grin, making a parody of a line in a popular piece.

"Why shouldn't I?" cried Mrs. Mertens, stamping her foot.

"You knew perfectly well that I was in Bucharest, and the telegram came from Berlin! You might have known that something was wrong!"

"That is just why I took the matter so seriously. If you are in Berlin, said I to myself, there are important and surely very unpleasant reasons!" With a smile the slim piquant creature added: "Besides, my dear sir, didn't you get caught by the same trick?"

"You may be sure that I should not have crossed the Carpathians unless I by chance had business at the Magyar Bank here."

"What simply charming logic!" said Mrs. Mertens, dancing a few shimmy steps. Then she took a small comb from her pocketbook and calmly rearranged her hair before the mirror.

Suchinow walked up and down thoughtfully. He seemed to be undergoing some inner struggle, and the most vivid anxiety appeared on his careworn face.

"Then the other telegram is not from you?"

"No!—Besides, you are looking very poorly, father; you ought to take things easier," warbled Mrs. Mertens.

Uncle Sam rubbed his hands. "Did she say 'father'?" The mystery was beginning to become clear.

"Quit that silly talk; I have something to think about besides my complexion. Have you still the letters for Korf?"

"I left them in Berlin, in a safe place."

"With whom?" asked Suchinow curtly.

"With our former porter."

"Does the man know . . . . ?" said he, while his glance was threateningly directed at his daughter's pretty eyes.

"Nothing from me, anyway," she answered snippily.

"From whom else, then? Doubtless the man has betrayed something. That comes from trusting silly women."

"My dear father, I did not ask to be trusted. If you are not more polite, I shall simply leave you here and go. What do I care about your whole business? Don't bother me with your mysterious activities.

Mrs. Mertens, still occupied at the mirror until this moment, now executed an elegant turn on her heel, put her hands in the little pockets of her coat, and looked imperiously at her father.

Uncle Sam was sorry for the man, as he relentlessly walked back and forth, cudgelling his brains to get on the track of the sender of the telegrams. "Don't take the trouble, sir!" he thought, as Suchinow picked up the telephone, only to throw it back on the hook again angrily, after several attempts to get a connection.

"The porter must know who occupies these rooms," he said, gnashing his teeth. "Woe to the fellow who has dared intrude in my affairs! Let us go; there is nothing to be learned here."

Sam waited a while longer, after they had gone. Then he crept out from his hiding place, put out all the lights, and left the hotel by way of the back stairs and restaurant. His first visit was to the Ernemann store, the work-rooms of which were fortunately not yet closed. They shook their heads at Finkle's demand, on which he absolutely insisted, that the three plates must be developed and printed this very night.

"The prints will not even be dry in this short time."

"Then I shall simply take them wet, and it will be all right. They must be delivered in my hotel tomorrow morning by seven o'clock. Please keep the plates for me carefully. If I desire any more prints, I shall write."

He was unwilling to be put off by evasions, and he managed to obtain the promise that his work would be performed.

Sam breathed easier when he had left the store. He had done enough for today, and he was satisfied with his success. In youthful exuberance he spread out his arms and cried: "Now, you merry city of carefree pleasure, now I can see you!"

CHAPTER VII

A Confession

IT was long after midnight when old Sam returned to his hotel. The porter, sleepy-eyed and yawning behind his hand, informed him that a lady had come in the evening, who asked for Mr. Suchinow, and soon afterward a gentleman, who asked for Mrs. Mertens. They had waited a rather long time. Later the gentleman had come several times and had insisted on seeing Dr. Finkle. The porter had pointed out, however, that the Doctor had gone out shortly after five and had not yet returned.

"Unfortunately I was detained by various business affairs," said Sam, well pleased. "Is the gentleman coming again?"

"I believe so."

"Very well, please inform me as soon as he is here."

The porter doubtless had his own ideas about the business which had detained him after midnight, but he wisely kept them to himself, only betraying them by a slight smile.

During the night Sam did no more thinking and planning. He had hardly pulled the bed clothes up around his neck, when he fell fast asleep. The heavy Tokay wine had done its work.

The sun was high in the heavens when he awoke the next morning. It was almost ten o'clock. He hastily jumped out of bed and dressed himself. On the table was a great yellow envelope from the Ernemann store.

"Then there really wasn't such a hurry," he thought, "since Mr. Suchinow does not seem to have been here yet. But it is best to be ready!"

He opened the envelope and made an enjoyable examination of the pictures. They had come out well, sharply defined and sufficiently lighted. It made a really comic impression on him to find that one picture, showing Mrs. Mertens and Mr. Suchinow at the height of their quarrel, depicted the lady, obviously very excited, holding a piece of paper before the eyes of the man, while her other hand hung in the air in a violent gesture. The perplexed face of Suchinow was very funny.

"Humor is necessary!" philosophized old Sam, as he rang for breakfast.

Meanwhile Dimitri Suchinow was coming up to the porter in the lobby.

"Can I now see Dr. Finkle?" he asked brusquely.

"Certainly," the porter hastened to reply, "he is expecting you. I shall immediately inform him of your arrival."

"He is expecting me?" muttered Suchinow, taking a seat in a corner of the almost empty lobby. "The shameless man!"

Sam appeared only after some time. He could not deny himself the pleasure of having a little revenge for the long wait the previous day in the dark bedroom.

He went straight up to Suchinow. "Mr. Suchinow?" said he.

"You know me?"

"Yes, indeed!—I am Dr. Samuel Finkle," said he, by way of introduction. For a while the two adversaries looked fixedly at each other. Suchinow tried to hide his worry and excitement by a rough manner, whereas Sam showed himself as sociable and unconcerned as ever, and his manner did not indicate that he was enjoying himself very much.

"Shall we not sit down?" asked Sam politely. "I think we have all kinds of things to say."

"Our conversation can only be very brief, sir. What right have you to meddle with my affairs? Your silly jest with the concocted telegrams has cost me two days, two precious days which cannot be replaced. I demand an explanation and satisfaction!"

Suchinow spoke quickly and sharply, and there was a threatening flash in his dark eyes.

"I am ready for any satisfaction, sir!" replied Finkle calmly. "I advise you, however, to lower your voice a little. Things might be mentioned which for your interest had better remain heard

only by ourselves."

Suchinow grew a trifle pale.

"What do you mean?" he burst out. "I beg you to . . ."

"Mr. Suchinow!" Sam interrupted him quickly. "Shall I send this photograph to Mr. August Korf in Friedrichshafen?"

The name of Korf affected Suchinow like a blow. With trembling hands he took the picture which Sam held out to him. Then he sank with a groan upon a chair and pressed his hands to his temples.

Sam waited quietly until Suchinow slowly raised his head again. He was startled by the pale face and fevered eyes.

"You spied on us," he said feebly; "that is infamous!"

"We will not argue as to whether this was infamous or not, sir!" said Sam politely, almost cordially. "Proper and infamous are relative ideas, regarding which opinions may be very different. Anyway, I know just how matters stand!"

"What are you going to do?"

"That depends on you, sir!"

"What do you desire?" asked Suchinow quickly, and a ray of hope crossed his face.

Old Sam himself did not know what kept him from crushing this man, who doubtless had a theft on his conscience.

"You are mistaken as to my identity. I am Korf's brother-in-law."

Suchinow sank back again, a picture of hopeless despair. "How did you learn that I was connected with Mrs. Mertens?" he said softly.

"Through a postage stamp which was badly stuck on," replied Sam. Then he added: "Mr. Suchinow, are you willing to answer a few questions for me?"

"Go ahead and ask!"

"Do you give me your word of honor that your replies will be the exact truth?"

"My word of honor?" asked Suchinow, mockingly. "Can my word of honor still signify anything to you?"

"I see in Mr. Suchinow not a villain but a man who has been the prey of his own immeasurable ambition," said Finkle calmly, watching the effect of these words. Suchinow bit his lips.

"Good! I give you my word of honor! Just ask!"

A Word of Honor

FINKLE waited a while, in order to arrange his ideas. He could not conceal from himself the fact that he pitied the careworn haggard man, ambitious and doubtless talented, now witnessing the ruin of his hopes and the complete failure of his life's work when success seemed just at hand.

"Mrs. Mertens is your daughter?" he began the inquiry.

"Yes."

"But her maiden name is Weisz, not Suchinow?"

"She bore the name of her deceased mother, a movie actress of Budapest, who was never my wife."

Sam was pleased with the frankness with which Suchinow touched on so delicate a theme.

"The correspondence with Korf doubtless was intended to keep him from further investigation, was it not?"

"This question I cannot answer."

"Very well. Here is something else. Is the rocket carrying any persons?"

"An engineer named Skoryna, a close connection of mine, is guiding the machine." Sam thought that at these words he perceived unfeigned sorrow in the expression of the Russian.

"How is your undertaking financed?"

"By the Transcosmos Stock Company, the founder and chief stockholder of which is the Roumanian oil magnate, Romano Vacarescu. But why do you ask questions about things which are common talk in Bucharest?"

"It is more convenient for me to get information directly from you. Besides," said Sam with a smile, "you probably would hardly answer other questions."

Suchinow did not reply, and Sam continued:

"What will be the financial consequences for Vacarescu in case your rocket comes to grief?"

"The shares of the company would then be as good as valueless, that is obvious. Besides that, the insurance deposit for Skoryna would be due. Vacarescu has opened an account at the Magyar Bank, from which twenty thousand English pounds are payable if Skoryna's death is demonstrated or if the rocket does not return within a year from the start."

"Payable to whom?"

"That is something I do not know. Skoryna has deposited the disposal of this sum under seal in the Magyar Bank."

"And if the rocket returns safely?"

"Then Vacarescu is practically the sole owner of the first space ship company in the world. The value of the enterprise would rapidly increase."

"And you?"

"I am and remain the technical head of the Transcosmos Company."

Uncle Sam arose, satisfied with what he had heard.

"Thank you for your information, Mr. Suchinow. I should like to make you a proposal, not unlike a truce. I cannot promise to regard the entire affair as closed, but I am willing to refrain from making matters public so long as you do not interfere with my undertakings and remain absolutely neutral, whatever may happen. I do not need to point out again that I have means of countering immediately and effectively any intrigues on your part. Nevertheless, I ask for your word."

"My word, sir," said Suchinow calmly. For an instant the two men gazed at each other. Then Finkle bowed slightly and withdrew. He had the conviction that the Russian would keep his word.

Suchinow remained a while longer, deep in thought. Then he suddenly jumped up and hastened away madly. An auto took him to the flying

field, where the Aero-Union plane was just getting ready for the flight to Bucharest.

Three hours later he was entering his offices in the Calei Victoria.

CHAPTER VIII

The Drive Begins

THE drive for money to construct the Korf space ship was started. In all the papers appeared warm appeals, written by Director Heyse, calling to mind the fate of the *Graf Zeppelin* and addressed to the national spirit of the country.

On the occasion of the meeting of the Society of German Engineers, Heyse (who was a member of the board of directors) took the opportunity to make an impressive appeal on behalf of Korf's project, closing with these words:

" . . . . The Dirigible, the *Graf Zeppelin*, years ago spread over the whole earth the fame of German spirit, German technique, and German work, so that our former enemies recognized that this nation was alive, despite all suppression.

"And now the lofty music of German ability shall resound to the canopy of stars—in distant unknown worlds the German colors shall shine and announce that this nation lives!"

A thunder of applause stormed about the speaker, whose heart became light, while inspiration carried him away.

But it is quick work for the dullness of every day to swallow up the inspiration of a festival occasion. It is one thing to be present at a festive gathering, in evening dress and starched shirt, listening to a speaker with enthusiasm, as he says, "We will be a united nation of all brothers!" But it is quite another to sit in an office, in shirt sleeves, behind a heap of unsettled law papers, wishing some Meier or Huber (who found something missing in the last delivery) carried off to the place where pepper grows.

To be sure, Heyse's appeal had not been without effect. But many a patriot of the drinking table, actually overflowing with enthusiasm on occasion, felt Heyse's words deep in his heart and still seemed to find an unavoidable hindrance to subscription in the shape of an unfilled pocketbook.

Funds came in slowly and weakly, in very small amounts, though all the larger newspapers had come to the aid of the enterprise, opening and publishing lists of subscribers.

Neverthless, Korf was not deterred from starting the construction. He hoped that greater sums would come in from somewhere. Councillor Heyse tirelessly showed the Stuttgart officials in detail how much the great construction at Lake Constance would enliven the dull demand for labor, giving hundreds who were out of work at least temporary employment and pay. Promises were made to keep it in mind, to talk it over with the representative of the central government; they would see what could be done. But for the moment that was all.

The failure of the public to subscribe was due in part to the uncertainty as to the success of the Suchinow rocket, which was everywhere the usual topic of conversation. They were too much inclined to identify the space rocket with Korf's space ship.

* * *

The great mathematics lecture room of the technical college in Munich was full to overflowing. The audience sat packed in the long rows of seats, people crowded the aisle, and hundreds had to turn around again on the stairs, since it was impossible to find even the smallest standing room in the great hall.

August Korf was speaking of the problem of spatial navigation and its solution.

On the platform stood the broadshouldered man whose name had been so often mentioned. His clear, grey eyes surveyed the gathering, while between his fingers was rolling a piece of chalk. He calmly waited until the unrest in the hall was stilled.

Then he began:

"Ladies and gentlemen! The rocket of the Russian engineer Suchinow has shown mankind that a trip to the moon has been removed from the realm of fiction and made reality."

There was absolute stillness in the auditorium. As though enchanted, all eyes were on the speaker's lips.

"The shot into infinity is nothing absolutely new. Decades ago eminent physicists busied themselves with this problem and indicated its solution as perfectly possible after the overcoming of a few technical difficulties.

"The first and simplest projects of this sort depended on sending a body from the earth at such speed that, passing the field of attraction of the earth, it would not fall back again upon our planet. But this idea had to remain impossible, except in phantasies of the Jules Verne type, since the entire necessary speed of not less than twelve kilometers a second would have to be given such a shot right at the start. Quite apart from the fact that no living creature can endure such acceleration, even the construction of such a giant cannon belongs in the realm of fancy.

"A serviceable means is provided by the rocket, however, whose effect depends on the recoil of explosion gases flowing with great force through narrow exhaust pipes. The motion of the rocket is not caused by the fact that the gases issuing out push on the air; on the contrary, it is based on the purely mechanical law of the maintenance of the centre of gravity. This is the same law which conditions the recoil in the case of fireworks. Accordingly, the rocket principle does not fail to act in airless empty space but on the other hand develops its greatest efficiency right there, since air resistance and earth attraction alone hinder the motion of the rocket."

Korf's Appeal

KORF then covered the two great blackboards of the lecture hall with sketches and formulas, by which he explained the operation and construction of the space rocket.

"You see," he went on, "it is perfectly possible to send a rocket relatively slowly from the earth. That is, the acceleration will be such that the human system can endure its pressure. Since the amount of fuel to be taken along is limited by the practicability of the apparatus; everything depends on the kind of fuel and its latent chemical energy.

"My earlier experiments showed that a certain mixture of powerful explosive powder produces an intensity sufficient to carry a properly constructed rocket beyond the limit of gravity, provided the machine is very quickly (in little more than a minute, that is) brought from the condition of rest to the necessary speed of twelve kilometers a second. In this case the acceleration pressure becomes effective, completely excluding the carrying of human beings or at least subjecting the lives of the crew to this extreme utmost risk. Prolonging the time of the start would certainly remove this danger; it would, however, naturally have the result that the rocket would have to struggle so much longer against the field of gravity of the earth and would be compelled to use up its fuel before attaining the speed necessary for finally passing from the earth's field.

"Whether Mr. Suchinow has been able to strike a satisfactory balance betwen these two possibilities, I do not know.

"Things are otherwise with my space ship. . . ."

A stir which ran through the hall caused the speaker to wait a few moments until the multitude was absolutely silent again. Then he continued:

"To be sure, the machine which I have planned depends also on the rocket principle. Yet after long struggles and missteps I have finally succeeded in making an arrangement using liquid fuel as a source of energy instead of powder energy cartridges. Therewith the problem of conquering the solar system has come an immense stride closer to realization. For my combination of hydrogen, alcohol and oxygen affords per kilogram almost three times as much energy as the same amount of the best available nitrocellulose powder, the expulsion speed being over 5,000 meters a second.

"And it depends on this alone."

Again there was a whispering among the hearers. After the previous explanations it was clear to everyone what this fact meant for the safety of the crew, indeed, that by this means the entire question of spatial navigation was for the very first time approaching a satisfactory solution.

With satisfaction Korf observed the impression produced by his announcement. He continued speaking for about an hour more. Forcefully he tried to convince both the public and the scientists of the practicability of his ideas and to stifle at the start any possible doubt by giving unquestionable calculations, keeping secret only the final details of construction.

"Ladies and gentlemen, I am drawing my talk to a close. The first aim of my space ship is the encircling of the moon. It is, however, no longer doubtful that with the machine which I have explained, actual cosmic speeds may be attained, sometimes making use of the field of gravity of the sun. And we may rightly hope that in no distant time it will be possible to pay comfortable and safe visits, within travelling times possible for human beings, not only to our nearby moon but also to the neighboring planets Mercury, Venus, and Mars—perhaps even to Saturn with its rings, perhaps to distant Neptune itself."

As Korf closed his remarks with a brief bow, there was a moment of oppressive stillness in the hall. Then it was like the coming of a storm. The floor shook beneath the stamping of the college boys, a mad clapping of hands expressed thanks to the great inventor, there were shouts of "Hurrah for Korf!" and the entire crowd pushed toward the platform to carry Korf from the hall on their shoulders.

Then the Swabian arose with flashing eyes, commanding silence by a wave of his hand. His clear voice rang out through the hall:

"Women and men of Germany, I thank you for your enthusiasm! Yet demonstrate it not by words but by deeds! All help out, so that the space ship may not remain a mere project. Help out, so that it may be a secure possession of our sorely tried country!

"I have sacrificed my property to it. I am standing here a beggar! Now it is your turn!"

Silence prevailed as Korf left the hall. Yet in hundreds of eyes he saw understanding shine forth ready for action; understanding, which gave him new courage to continue working without hesitation on his great task.

CHAPTER IX

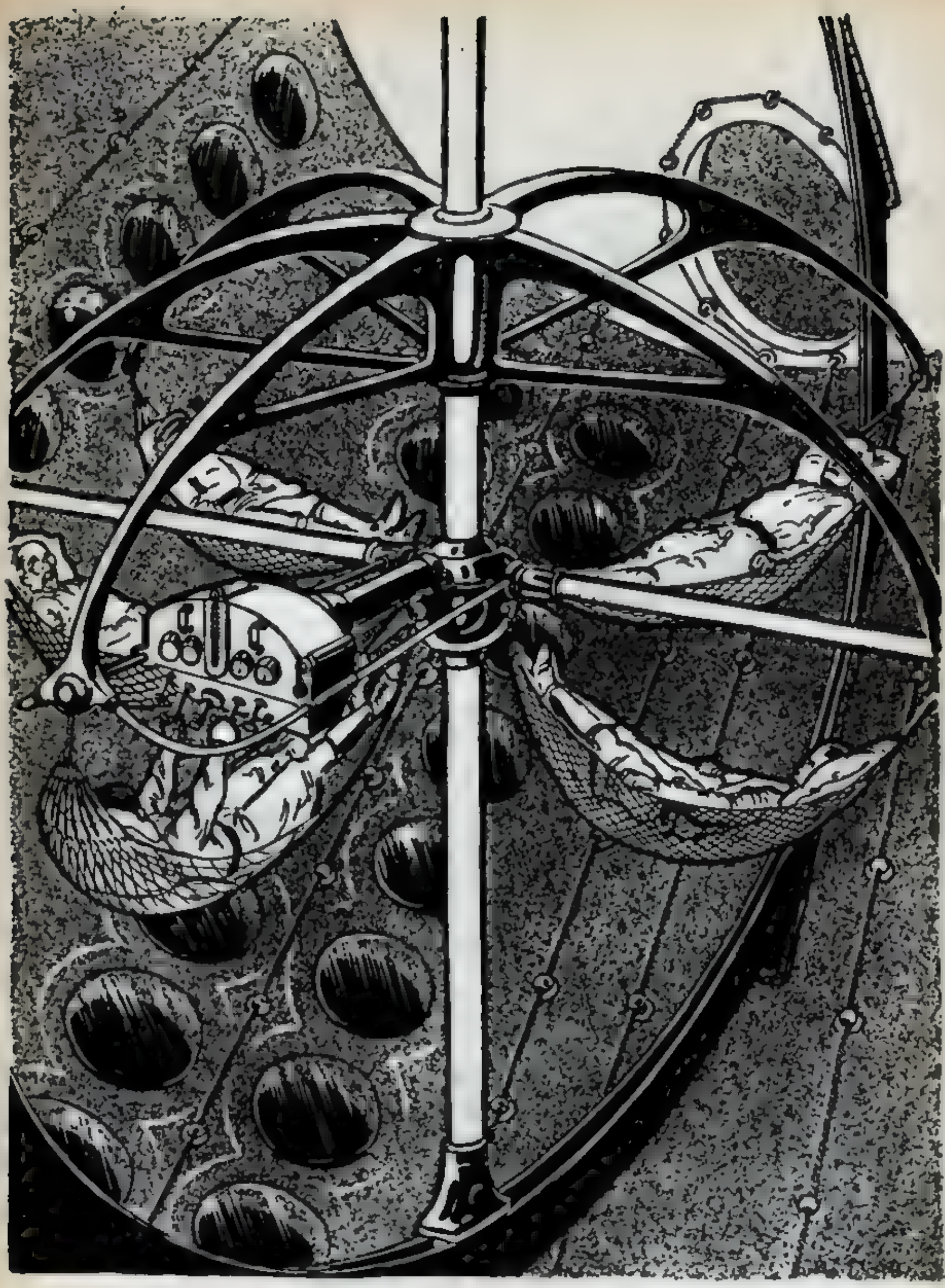
Finkle Investigates

DR. FINKLE, meanwhile, had not passed the time idly. He had remained several days longer in Budapest and had made some discoveries about the Mertens couple.

It became more and more mysterious to him how Korf had been attracted to this woman and had been able to think her a serious scientist. Even if the hateful remarks of the Berlin porter were perhaps exaggerated, there was no question that Mrs. Mertens, now successfully appearing as *première danseuse* and leading a very gay life, had no interest for anything but clothes, new dances, costly dinners, and numerous cavaliers. Gus must have been smitten blind when he took this society creature as an assistant.

From German papers, which Sam purchased, he learned of the commencement of the drive for funds for Korf. He also found a full text of the Munich lecture. With great interest he followed the daily reports about the course of the rocket, now circling about the moon.

"Will it return? Is it held fast by the moon? Is the occupant still alive? Will it be wrecked on the return trip?" These were questions appearing day after day in the press and dealt with more or



Korf gave full gas to the main exhaust. The thunder of the explosions increased, becoming a roaring and crackling. The acceleration indicator crept up the scale and wavered at the point twenty.

less logically. The outcome of the "shot into infinity" was still uncertain when Sam left the merry lighthearted city on the Danube to pursue his plans further in Bucharest. He had not yet sent any news to Korf.

Finkle chose the roundabout route via Hermannstadt, in order to look around a bit in the Oltu Valley, before honoring Mr. Vacarescu by a visit.

In Calimanesti he left the slow train which thrice daily snorted its way through the narrow valley from Hermannstadt to Slatina at not more than a snail's pace. Vainly he looked about for a carriage. There was nothing to be done but go on foot the several hours' journey by way of Berislavesti to Suicii. He took his time and had much enjoyment in the gloomily majestic landscape, in which there were no little hills and slopes, the darkly wooded Carpathians rising steeply from the valley and mounting up to heaven.

In Suicii he derived considerable benefit from his slender knowledge of Roumanian. Cautiously he questioned the dirty mountaineers, wrapped in sheepskins in spite of the heat, like that of a belated summer. They had not yet recovered from the terror caused by the thundering rocket. With evident horror they told in a mixture of Roumanian and Hungarian about the devil's work on the plateau. The earth had been torn up, a hellish glow had flooded the mountains, and everyone had thought it the end of the world.

"You know, master," an old ragged cowherd whispered to Sam, "things weren't right up there. The devil himself was taking a hand. Just think, when the devilish noise was over, the heavens were covered with thick clouds, for weeks there was grey mist in the valley, and . . . "

"That's nothing remarkable!" laughed Sam.

"Don't jest, master! The mist was nowhere from Cainenii to Slatina, only here in the neighborhood of the bewitched plateau. And it wasn't any ordinary mist. It was made of dense heavy gases, hot as beef stew—and . . . " he brought his mouth close to Sam's ear and whispered, "it smelled like pitch and sulphur!"

Sam remembered that Korf had once told him the energy cartridges were filled with powder, which on exploding evolved an extremely evil smelling gas. It was right; he had at the same time mentioned that the rocket on starting left behind a stream of such superheated combustion gases that it was advisable to start the machine in some place not densely populated.

"Can one see the works at the Valeni monastery?" he asked.

The old man crossed himself. "For the sake of your soul's salvation, master, do not go there! No Christian now enters the valley of Valeni, where at night the poor souls have to work for the devil."

In spite of this insistent warning, Sam walked to the monastery along the road which had been softened and cut up by heavy trucks. The villas on the side of the mountain seemed abandoned. The cable line hung motionless and unused across the valley. In the monastery yard a few people were busy piling up great steel containers. Unchallenged, Sam passed through the gate and watched the workers a while. As though in sport he picked up one of the empty steel cases which lay about, looking somewhat like shrapnel cases and containing about a liter.*

"Can I see Mr. Suchinow?" he suddenly asked. In surprise the workmen, who had hitherto turned their backs to Sam, turned around and stared in wonder at the intruder. Since he received no answer, he repeated his question in French, likewise getting no response. "Suchinow?" he then said slowly, stressing each syllable: "Su-chi-now?" He also made a questioning gesture.

"Suchinow?" repeated one of the workmen. "Suchinow Bucharest!" And he pointed to the south.

Without concerning themselves further about the visitor, they again returned to their work.

Sam climbed up to the plateau.

Tall massive concrete pillars rose in the air, enclosing a deep circular excavation in the earth, which was half full of mud. Clumps of earth lay scattered all around for a great distance, as though an immense bomb had burst in the space surrounded by the pillars.

Utterly exhausted, Sam reached Calimanesti that evening. Fortifying himself with some corn bread and plum brandy, provided him by the station master, since there was no restaurant, he continued his journey on the night train.

In Bucharest he had a real sleep before continuing his investigation, which now was chiefly concerned with the financial basis of the Transcosmos Stock Company. It did not prove difficult, by way of cautious questions at the leading banks, to find out that Vacarescu had in his own hands about sixty percent of the entire capital stock, the remaining forty percent having been taken over in equal amounts by two Bucharest financial interests, the Transsylvania Company, and the Bank of Roumania. Since Vacarescu first of all had reckoned in his expenditures in building the rocket and from the remaining actual funds had provided the insurance sum for Skoryna, the shares were evidently worth at most sixteen percent, in case the rocket should come to grief and Skoryna be killed.

"A risky business!" remarked Finkle to the head clerk of the bank, who gave him this information.

"Yes, the stockholders risk a great deal!" the latter agreed. "Doubtless many would rather sell below par to-day than tomorrow. Still, if the venture succeeds, then the stock will rise."

"Well!" said Uncle Sam. "How would it be if the Transcosmos Company encountered competition which would settle its fate, even if there were the most successful outcome for the rocket enterprise?"

With these words he passed through the window the newspapers with information about Korf's project.

"The construction of Korf's space ship has com-

*(1,000 cubic centimeters)

menced. Don't you think that it can at least be very injurious to Vacarescu's undertaking?" Sam added, while the banker scanned the news with increasing interest.

"Thank you very much, sir, for your hint. May I make further use of it?"

"You are very welcome. You will be able to get further information in any German or Austrian paper. The papers here seem to be showing extraorinary reticence regarding this coming event."

Confronting The Financier

FINKLE was also able to secure access to the managing office of the Transsylvania Company. He freely admitted that he was connected with Korf and wished to get information regarding the basis, plans, and further intentions of the Transcosmos Company. He firmly denied the suggestion that there might be some interests in common.

Thus he slowly but surely undermined the value of the Transcosmos stock, and the confidence of the shareholders was again destroyed. The reports from the observatories did the rest. It seemed more and more certain that the rocket was permanently circling about the moon. Whether this was intentional or forced was a question which all the observers considered but which none dared to answer.

When Sam thought the preparations sufficient, he went one day to the little palace on the Dimbowita, Vacarescu's home in the northwest quarter, where the villas of the rich of Bucharest are to be found. He was received with a polite but unmistakable shrug of the shoulders. Mr. Vacarescu was not at home. Twice more he tried it, after which he lost patience.

"Mr. Vacarescu is accustomed to be at home at this hour!" he said to the liveried servant. "Announce me again and say that it is a question of something extremely important for your master, something allowing no delay. Give him this card." He then drew out a new visiting card and wrote a few words on it in pencil. After a short time the servant reappeared.

"He will receive you tomorrow noon in the office of the Transcosmos Company!"

"Fine!" grumbled Sam. "One day shall not stand in the way."

The following noon Sam was promptly in the Calei Victoria and was at once admitted.

Vacarescu was sitting at the desk in Suchinow's private office. He was alone. Sam was much pleased to be able to converse alone with the noted financier. At first no notice was taken of his entering.

"What do you want?" Vacarescu asked after a while, without turning around.

"First of all, a seat!" answered Sam angrily. He was always roused by impoliteness.

Vacarescu slowly looked up from the desk, his thin nose trembling strangely. With boundless amazement he gazed at the man who dared confront the oil magnate Romano Vacarescu in such a way.

"You speak boldly, sir!" he said with a drawl, making however a gesture toward the sofa.

"I am accustomed to politeness!" said Sam calmly, sitting down.

"Who are you and what gives me the pleasure of your visit? Please make it brief. I do not like verbosity."

"My name is on my card. I invite you to open an unconditional account for a German inventor."

Vacarescu's lids lowered, and he reached for the bell.

"Sir," said Sam quickly, "you can have me thrown out. But I assure you, very soon you will be asking me to visit you, and I likewise assure you that I shall not return a second time."

The fat fingers with the many rings slowly withdrew from the bell.

"Well, then, what do you want?"

"A loan, as I already told you."

"And the security?"

"The word of an honorable man."

"Won't you express yourself more concretely? You are beginning to weary me. For whom do you desire the loan—for yourself, maybe?"

"For my brother-in-law, August Korf."

Vacarescu looked up quickly, interested.

"For the Swabian inventor?"

".....of the space ship," added Sam by way of supplement.

"I am amazed at your strange request. Do you know that you are speaking to the founder and chief stockholder of the Transcosmos Space Ship Company?"

". . . who is risking a fortune in it, and whose only mistaken speculation, perhaps, is the Transcosmos Company."

"You seem very daring, sir. If you seriously wish to suggest that I again take part in such an undertaking, please do not waste your time any longer."

"You are mistaken. There is no question of your taking part. I want merely a loan, an unconditional loan due only at the end of five years. We can come to an agreement regarding the interest."

"Is this why you came from Friedrichshafen to Bucharest?" Vacarescu seemed amused.

"Certainly!"

"You might have saved yourself the expense."

"We shall see. First let me give you some advice. It would be advantageous for you to buy up the forty percent of the Transcosmos stock which is in other hands."

"I suppose you know from some reliable source," said the fat man scornfully, "that the flight of the rocket will result absolutely satisfactorily, isn't that so?"

"On the contrary, I am absolutely convinced that the 'shot into infinity' is dying away without effect," said Finkle, while the twitching at the corners of his mouth showed his meaning still more.

"Stop!" he added, noticing that Vacarescu was again reaching for the bell. "My mind is perfectly clear, and I know exactly what I am saying."

For or Against Korf?

THE Roumanian drummed nervously on the table. "You are putting my patience to a hard test. If I still listen at all, it is only because I am really eager to know how you intend to make this tissue of absurdity at all plausible."

"Patience brings its reward, says an old German proverb, the accuracy of which you will at once perceive."

"Speak to the point, if I may ask!"

"All right! If the rocket comes to grief and the insurance sum for Skoryna has to be paid, the assets of the Transcosmos Company will be so reduced that the shares can be valued at not more than sixteen percent."

"You have exact information!"

"As you observe! In this case you lose about eighty-four percent of your investment."

Sam would not be turned aside.

"Surely! For to-day you can get the shares of the other investors for not more than seventy percent of par; if you proceed carefully, they will be cheaper! Thereby the average cost of your total investment would be reduced from one hundred percent to about eighty-eight."

"Correct! What then?"

"Now, assuming that the rocket is still safe and Skoryna alive, you can so manage by liquidation of the company that you lose nothing."

"But man!" cried Vacarescu impatiently. "In that case I have no idea of liquidating!"

"Under certain circumstances you will have to have this idea, Mr. Vacarescu! But let us leave that for a moment. I repeat: if Skoryna is alive and you follow my advice, you will not lose a penny. Now, you are doubtless aware of the course of the rocket to date. In all probability it will keep on circling about the moon until—please excuse me if I light my pipe—it makes talking so much better—"

"Until it . . .?" insisted Vacarescu.

"Until it is reached by Korf, and Skoryna is rescued, and thereby the payment of the insurance is avoided."

Vacarescu was silent for a long time, while Sam comfortably blew thick clouds of smoke into the air.

"Then I am to risk further outlays to save my previous investment—you really mean that?"

"You have understood me perfectly. Besides, there might not be any excessive risk in it. Listen!"

Sam unfolded a few newspaper pages and translated to the attentive financier the reports of Korf's lecture at the technical college in Munich.

"Don't you think," he added, "that work is being prepared here to which your company must surrender?"

"Man, don't you consider," cried Vacarescu in excitement, "that you are asking me to finance my most dangerous rival—assuming that all this is correct—and to finance him unconditionally?"

"Mr. Vacarescu!" said Sam, rising. "Consider well whether you are willing or unwilling to seize this solitary chance to save Skoryna and to withdraw without loss from your enterprise. In brief, this is the question: with or against Korf! Since I may doubtless assume that you will wish to discuss this decision with General Director Suchinow, as I strongly recommend, please give Mr. Suchinow this package. He will surely give you the right advice. I shall wait until tomorrow evening for news of your decision as to the main point. The further details are entirely subordinate."

"Good-bye, sir."

Sam departed, and when the outside door had closed behind him, he laughed so loudly that the passers turned around to look at him.

The package contained the empty energy cartridge and the Budapest photograph of Suchinow, on the back of which Sam had written these four words:

"For or against Korf?"

CHAPTER X

The Call from the Skies

MR. NIELSON, the aged observer of the Lick Observatory, had pointed the telescope exclusively for studying the rocket. Night after night he sat at the eye-piece and did not let the space ship escape his vision.

The conflicting emotions which stirred within the old investigator had brought him into a strange state of mind. However perfectly he could follow with his own eyes the rocket at night, however exactly he calculated its path on the basis of the construction figures which Suchinow had now published, he nevertheless simply could not believe that man could safely dare to leave his place on earth, appointed to him at creation, and force his way into the secrets of infinity. Though he convinced himself every night that the rocket was pursuing its course without deviation, it had become absolute certainty to him that the bold man who was circling about the moon up there in space, separated from his fellow beings, out of reach of any communication, must be dead.

On the fourth day after the start, the tiny dot of light appeared at the distance of a few diameters of the moon northwest of the now fully illuminated disk. Then it seemed to approach nearer and nearer to the moon, touching the disk, and then disappearing. Some ninety minutes later it appeared again at the southeast edge, made a very narrow loop, and again entered the disk at the southern end. The rocket had gone around the moon and was now passing in front of the disk.

Since this procedure was repeated at equal intervals, the assumption was that the rocket was circling about the moon in a regular gravitational path. Exact measurements gave an orbital time of three hours and six minutes, with a distance of two thousand five hundred kilometers from the centre of the moon. The moon therefore had acquired a tiny satellite of its own in the shape of the rocket which

was travelling just eight hundred kilometers above its surface.

Not the slightest irregularity in the motion indicated that human hands were involved and that the rocket was travelling its cosmic path as a space ship capable of being steered; rather than helplessly like a meteor or one of the tiny asteroids.

Weeks passed. The orbit of the rocket remained unchanged, and Nielson thought it impossible that a heart should be beating and a brain thinking up there in that tiny fragment of the earth. He was therefore all the more startled by a new and unexpected observation.

In the fifth week after the start, when the moon had again become full, the shadow of the earth came so close to the moon that the rocket, though not the moon itself, entered the shadow and disappeared.

Mr. Nielson was just going to leave the observation place, since the rocket would be invisible for some time, when he saw—was he mistaken or was it reality?—a weak, scarcely perceptible glimmer, a dot with a red glow. In truth, the rocket was illuminated without sunlight.

In excitement Nielson adjusted the telescope to the greatest enlargement. There could be no doubt! The space ship was artificially lighted from within.

The light went out, shone again, flickered, and again went out.

"Good Heavens! The man is still alive, still alive, all alone out there in the void!"

The assistant rushed up.

"Do you see the gleam of light?" asked Nielson, as the other scanned the heavens. He had grown pale and was trembling with excitement.

"Yes, sir, but the light is not steady. It is constantly switched on and off. What is that? Short—short—long—short—long? Mr. Nielson, it is—it is the Morse code. It's a message from space. Here it is again: short—short—long—short—long! Sir, it is the international Morse call-signal."

He actually shouted it.

Nielson clutched his breast, as though he would quiet his wild heartbeats.

"Write, sir—for Heaven's sake be quick—perhaps this is the only observatory which will get the call from the skies. Let me look, sir; my eyes are younger than yours! Again the call-signal. Now comes a word! Are you ready to write, sir? Short short short—long long long—short short short . . . "

Hastily the old scientist noted the dots and dashes with trembling fingers. Then the assistant sank back, deathly pale, horrified.

"What is it?" cried Nielson.

Feebly the assistant stammered: "S-O-S!"

"Great Heavens! The international call for help! Ship in distress!"

S-O-S, S-O-S, S-O-S cried the flashes of light from space, from an infinite and unattainable distance.

For a quarter of an hour the call was repeated. Then the dot of light by the moon went out. The rocket emerged from the shadow of the earth and once more shone in the reflected sunlight.

Silent and shocked, the two men looked at the paper, at the momentous dots and dashes. They had heard a message from space the cry of a human being in an agony of despair.

Send help—help!

Who was to help him out there in the void?

In a few moments the radio transmitter was busy. Skoryna's cry went around the earth and roused the better feelings of mankind.

CHAPTER XI

Near Despair

THE construction work at Lake Constance went on only slowly. First the Victoria Airport had secured an unoccupied piece of land beside the lake and had started the preparing of the ground.

A slope rising from the shore offered a good natural foundation for the starting track. Massive girders were erected in the depressions, the irregularities of the ridges were leveled off, and the natural and artificial supports so obtained were joined by great iron rails.

Thus resulted an absolutely straight runway, twelve meters wide and almost two kilometers long. It ran horizontally for a few hundred meters from the future starting point, then gradually rose, ending like a spring-board at the highest point of the slope, the gradient being thirty percent.

Daily Korf inspected the work for hours, making tests of the solidity of the foundation and investigating the quality of the concrete in his laboratory.

Then the construction had to wait a while, until enough funds had again come in to procure materials and pay the workmen. There was constant worry, until the day came which was to rid Korf of his cares.

It was already well along in October.

The mist came up from the lake, settling heavily on the fields, dulling the bright colors of the autumn woods, and veiling the sun from sight. The two greys of lake and air blended to make a sea of cold moisture. The steamers, seeming of an uncanny size, only loomed up out of the mist when right at the shore; they took on board the few passengers waiting and freezing on the slippery pier, and then disappeared again in the mist in a few minutes.

With the departing swallows there had also gone the last summer guests who sought to refresh themselves at Lake Constance. Silence lay over the little city, which was preparing to dream away the winter. In the wide-tiled stoves of the Swabian living rooms, baked apples and chestnuts were already cooking, the odor of which is a part of the real autumn evening. The last bit of warm weather came again, and the mist timidly crept away before the victorious sunbeams. The sky was a clear blue arch above the lake and the mountains, and the white sails once more sped over the water, taking

final farewell of the light and warmth of summer.

It was on such a clear and splendid autumn morning when the startling news of Skoryna's message came to the world.

Pensively Korf looked out into the distance. There could now be no more delay. The solitary man up there was clinging with his last power to a straw: send help!

But who was to help him? Must he not despair of the possibility of rescue?

A mad impatience seized Korf. It was only because of money, base wretched money, that he stood helpless before his half-completed construction. And up there in space a tortured, agonized human being was calling for him—for him! He alone could help! The ship would have been finished long ago, if these eternal financial difficulties had not put everything off.

The burning of his laboratory came to his mind. It was strange: chance, a trifling spark which produced the explosion, this had set him back many months in his work—and now the despairing wretch out in the limitless distance must suffer for it.

If only he could send him a message! If he could only flash to the moon this one sentence: Hold out! Was there absolutely no possibility of giving the rocket at least an indication that the message had been received on earth?

Korf felt responsible for the unfortunate person. One reproach gnawed at his conscience. Had it been right to refuse the foreign money, several times offered him, out of vain national pride? Did his ship really have to be merely German work throughout? Are not all nations alike before eternal infinity?

But there was no time now for reflection. Action was necessary: the construction had to be hastened as much as possible and completed, before the prisoner should despair of rescue and lose his mind.

Korf looked at the clock.

If he hurried, he could still catch the Munich express. He had to see the representative of the central government, then by chance visiting the Bavarian government, to impress on him the necessity of getting more money as quickly as possible. He hurried to his home to change his clothes. On the desk was a telegram which he heedlessly put in his pocket. It might perhaps delay him, and time was now all important.

On the train Korf became calmer. The comforting influence of speedy travel did not fail to have its effect on him. He carefully considered what he had to say to the official. They would have to listen to him and provide him with funds. A refusal would now be equivalent to murder.

At noon Korf arrived in Munich. Since he could not count on finding the official in his office before two o'clock, there was nothing to do but wait.

He was just walking toward the centre of the city and considering whether he should not have lunch in the meanwhile, when someone behind him called out:

"Hello! Hello!"

Korf stopped. An excited little man came running along breathlessly, his overcoat flapping behind him, a pipe in his hand, and pipestems sticking out of his pockets.

"Truly, it is Uncle Sam himself, in the best of health!" cried Korf joyfully, hurrying to meet him.

"Young fellow, you don't seem to recognize your old uncle any more!" exclaimed the latter, shaking his brother-in-law's hand violently enough to dislocate his wrist. "Just the same, it's fine that you came to meet me."

"Came to meet you? I did not have a ghost of an idea that you were in Munich."

"Why, didn't you get my telegram?"

An idea came to Korf. He fished from his overcoat pocket the telegram, which he had entirely forgotten.

"I received it all right, uncle," he said in embarrassment, "but I haven't read it yet. I shall at once do so."

"That is not necessary now, Gus," laughed Sam. "We do not need to communicate in writing at present."

"But how in the world do you happen to be right here, Uncle Sam, and why didn't you write for weeks?"

"You will learn everything. We just arrived at the Oberwiesen Airport in a Junker plane. That is far better than travelling in the torture chambers of a train."

"We?——Aren't you alone?"

"I am bringing along a man who will provide you with half a million for your work. That made you open your eyes! Didn't I tell you that old Sam had many acquaintances and would look about a little for you?"

Korf looked seriously at his brother-in-law. "You cannot possibly know how important your information is for me today, uncle! How did you manage it?"

"Gus, I will confess that I am terribly hungry. Isn't it best to do our talking in the Franziskaner café?"

"And your companion?"

"The two gentlemen went to the Excelsior. Tomorrow you shall see them in Friedrichshafen. Come on, Gus, forward march! I shall be immensely pleased to have a glass of extra dark and some leberwurst. If you care at all for your uncle, ask no more questions but hurry!"

Korf Parts with the Past

WITH some difficulty they found seats in the great hall of the Franziskaner. Sam would not answer any questions. He was interested only in the menu and seemed to be in the best of humor.

"Tokay in a café by the Danube in Budapest—soda at Riegeler's in Bucharest—March beer at the Franziskaner in Munich—what more could the heart desire?" he cried, when the foaming glasses were placed on the table.

"You went so far for the money?"

"In case of need, I should have gone clear to the

Ganges!" said Sam, setting to work on his sausages.

When he had averted the worst danger of death by starvation, he finally consented to give a connected story. He gave the fullest account of his investigations into the affairs of the Transcosmos Company and of his interview with Vacarescu, but he kept silent regarding the criminal investigations of his trip.

Korf listened with growing amazement.

"And the Transcosmos Company now wants to finance me?"

"Certainly! Vacarescu intends to open for you an account of twenty-five thousand English pounds, as soon, as he has convinced himself of the practicability of your project. For this purpose he wishes to examine your model tomorrow and he is bringing as an expert his technical director, this noted engineer Suchinow. Are you afraid of imperilling your secret by this?"

"No, not at all! But I should not like to have any foreign company get claims on my invention."

Sam grinned contentedly.

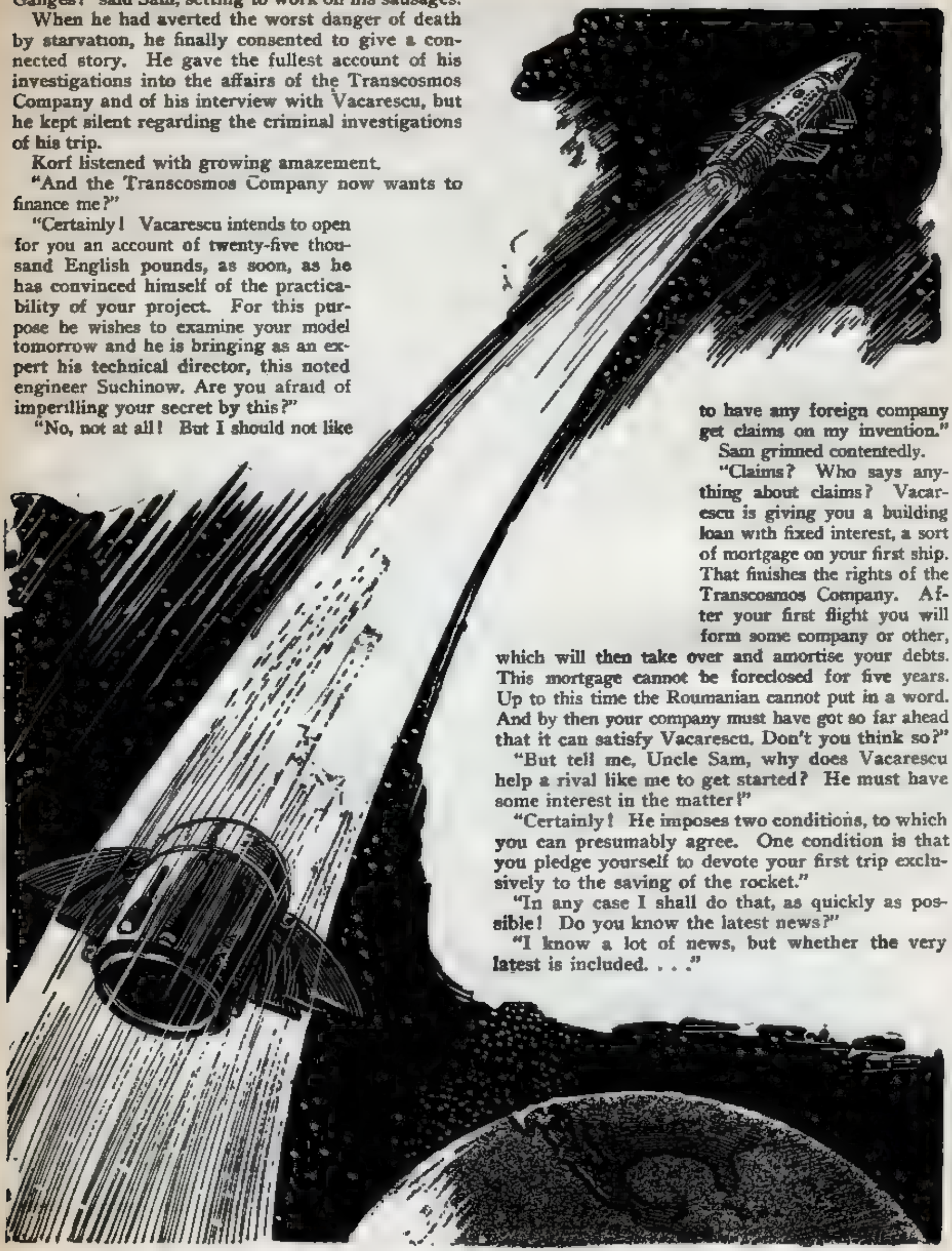
"Claims? Who says anything about claims? Vacarescu is giving you a building loan with fixed interest, a sort of mortgage on your first ship. That finishes the rights of the Transcosmos Company. After your first flight you will form some company or other, which will then take over and amortise your debts. This mortgage cannot be foreclosed for five years. Up to this time the Roumanian cannot put in a word. And by then your company must have got so far ahead that it can satisfy Vacarescu. Don't you think so?"

"But tell me, Uncle Sam, why does Vacarescu help a rival like me to get started? He must have some interest in the matter!"

"Certainly! He imposes two conditions, to which you can presumably agree. One condition is that you pledge yourself to devote your first trip exclusively to the saving of the rocket."

"In any case I shall do that, as quickly as possible! Do you know the latest news?"

"I know a lot of news, but whether the very latest is included. . . ."



The speedometer indicated six thousand meters a second. For the second time the ship divided. The pure hydrogen rocket flamed forth and spit its glowing vapors backward at an incredible speed.

"The rocket has sent light-signals to the earth, calling for help!" In a few words he told of Skoryna's message.

"Splendid!" answered Sam. "Now things are going right! Then Skoryna is still alive!"

"And Vacarescu's second condition?"

Sam became embarrassed and tried to evade the issue.

"It is only a trifle, though rather remarkable: you are simply to forget something, acting as though it had never had anything to do with your life, saying nothing more about it, and preserving absolute silence on the subject!"

"What is this 'it'?"

"Less an 'it' than a 'she'; well, I mean Natalka."

In surprise Korf remained silent, while Sam uneasily moved back and forth on his chair and took another drink of beer.

"Uncle Sam, you know more than you have told me!" said Korf in a mildly reproachful tone.

Sam blew his nose, to gain time to think. "See here, Gus, this Natalka is certainly worth no more of your thoughts than this: putting her in a box, closing the cover carefully, locking it, and then losing the key. At present she is appearing at the Orpheum in Budapest, dancing through life with her cavaliers—and August Korf is as indifferent to her as—as you are not indifferent to me, Gus."

"Are you certain about all this? You are torturing me, uncle; does it have to be so?"

Sam took out of his pocket the package containing Natalka's letters.

"See here! She wrote a supply of these letters a long time ago and deposited them in Berlin, in order not to have to think of you any more and to lull you to sleep slowly. There you have them all at once. Just throw them in the stove."

He ordered another glass of beer and silently watched as Korf tore up Natalka's letters, one after another, and burned them in the ash tray.

"So be it!" Korf suppressed his emotion. "Out there in empty space, at a tremendous distance, a human being is struggling for life in the most horrible position to which a living being has ever been exposed. I can bring aid, I alone! There must be no hesitation. I will try to kill my feeling for Natalka, in order to save Skoryna."

"You are a good man, Gus!" said Sam, much pleased. Then, thinking he had one more thing to do, he added, "I also brought you something else. It is Natalka's latest picture, as a reminder of your great folly."

He handed Korf the Budapest photograph, showing Mrs. Mertens sitting on the sofa. Korf quickly took the picture, examined it carefully, and then handed it back to Sam with a trace of disappointment.

"There certainly is a striking resemblance, but this woman is not Natalka."

CHAPTER XII

The Mountain Approaches Mahomet

KORF returned alone to Friedrichshafen. Sam wished to conduct his foreign guests to Lake Constance and therefore spent the night in Munich.

Monotonously the express thundered through the night. Korf had settled down in a corner of an empty section and was balancing up the events of the day. He was in a position to be satisfied. Even at the official's the necessity of quick action had been seen, and speedy provision of money was in sight. Probably there would also be more money coming in from the public drive for funds. This startling drama in space and this appeal from the skies must certainly rouse the feelings of mankind.

Korf opened the window and let the cool night breeze blow on his brow. "Hold out, lonely one up there!" he murmured. "Hold out and do not despair! I am coming!"

Then he thought thankfully of good old Sam. The withered bony man had accomplished something which Korf would never have believed possible for him. Yet Sam's story left him in the dark on several points. Where did he get Natalka's letters, and what was the meaning of the picture, which Sam had believed to represent Natalka? After the pointing out of this error Sam had remained in impenetrable silence. There was nothing more to be got from him. Who was Natalka, and what had she to do with Vacarescu, who joined so strange a condition with his loan? Would the veil which lay over Natalka ever be lifted, now that Korf had promised to preserve absolute silence on the subject and let her sink into forgetfulness?

Certainly he would keep his word to say nothing more about Natalka and to make no investigation about her; but he would never forget the brave heroine, all the more since Sam's suggestions had awakened his recollection and excited his interest by the mystery which surrounded her.

Involuntarily he thought of the story of the treasure digger who was forbidden to think of a rhinoceros while digging. In his whole life he had never been concerned with a rhinoceros, but now he could not get the subject out of his mind, and the treasure remained undiscovered.

With all his might Korf resisted the tendency to meditate thus. It was time for action, the world was waiting for his work. He could not squander his energy in futile scheming.

The following morning an automobile drew up before his laboratory, and three gentlemen got out. Sam introduced Korf to the foreigners. For a moment the two rivals, Korf and Suchinow, looked fixedly at each other; then Suchinow lowered his eyes. Even if the Russian had erred in his conduct, this penitential journey was atonement enough. It did not escape Sam that the Russian purposely had in one hand a brief case and in the other a small box, an unobtrusive way of avoiding shaking hands.

Since Vacarescu did not understand German and Suchinow remained silent, there was an uncomfortable silence in the great whitewashed room into which Korf led his guests.

The laboratory disappointed the visitors in its bareness. On the walls were maps and diagrams, and at the window stood an immense table covered with drawings. Except for the numerous electric wires coming together at a marble switchboard and a small table covered with a confusion of retorts, tubes, coils, and wires, there was nothing to indicate the development here of a technical marvel, a truly ingenious invention.

"I cannot show you much here," said Korf, breaking the stillness. "You know that lack of money has hindered construction. Still I think you can get a good survey of the project from the plans and calculations."

Then he explained, so far as seemed necessary, the gasification and combustion of the liquid fuel. He demonstrated the recoil effect by a small model motor.

Suchinow translated the separate sentences for Vacarescu and asked questions in the German heard in Poland and Russia, which seemed rather Jewish to a Swabian ear. These questions indicated quick comprehension and thorough technical knowledge. Sam meanwhile, taking no part and seeming rather superfluous here, stood in the corner and smoked. He had already done his part.

"Now that you appear to have succeeded in overcoming the technical difficulties involving the use of liquid fuel," said Suchinow, "hydrogen gas certainly seems to be the most favorable fuel for the space ship."

"You are quite right!" agreed Korf. "But not for the start. You must not forget that only a moderate initial acceleration is possible, in view of the lives of the crew. It would be wasteful to use hydrogen energy to produce the slight starting speed. For that a substance with a greater specific gravity, which increases the load, is even more efficient, because it hastens the penetration of the dense lower layers of air. It is only advisable to let the hydrogen rocket begin to function when its energy really comes to its highest efficiency, that is to say, in the high thin layers and at a greater speed.

"By using suitably mixed fuels, suited to the various speeds, the efficiency of the machine is immensely increased."

"Then how are you going to start the rocket?"

Korf looked sharply at Suchinow. "Until very recently I thought my dynamic cartridge the best solution of the starting problem."

The Russian bit his lips so hard that a drop of blood appeared. His voice was hoarser as he asked, summoning up all his self-control:

"And now?"

"Now I am not disposed to use solid explosives in any form. I have decided to use alcohol to run the lowest auxiliary rocket."

"Auxiliary rocket?"

"Yes. The space ship when ready to start will consist of three separate rockets joined together. The lowest rocket, using pure alcohol, operates the whole system from the start to the speed of about two thousand meters a second. As soon as it is burned out, it is uncoupled and cast off. Then the second auxiliary rocket begins to act, increasing the speed still more by its mixture of alcohol and hydrogen; after its tanks are empty, it is likewise cast off. There finally remains the pure hydrogen rocket, in which of course are the passengers, the instruments, and the means for controlling the ship. Thus only a small part of the machine which starts, the egg-shaped point, in fact, will make the flight into infinity as the actual space ship. On return to the earth it will have not more than a sixtieth part of the original total weight. In this way for every kilogram of essential weight there is so great a quantity of fuel and consequently of energy units that the safe passage of the limit of the earth's attraction is beyond question."

The Space Suit

WHILE Suchinow was explaining this to the financier, Sam came over to Korf.

"There is one thing I do not yet understand, Gus. How in the world can a person live in a space ship, in which he has none of the prerequisites for existence, air, pressure, heat, and even weight?"

"Those are the smallest difficulties, Uncle Sam! I simply take along a bit of the earth—with everything that pertains to life, including, of course, tobacco. You should rather ask how the exact investigation of the moon is to be managed!"

"What!" Suchinow took a hand in the conversation. "You intend to land on the moon?"

"Not on the first trip; that concerns only Skoryna. I intend to on my second expedition. Naturally the crew must be able to leave the space ship."

"On the airless moon?"

"Not only on the moon but also during the trip though space, sir!"

"Isn't that a mere fancy?" said the Russian skeptically. He regarded the scheme as madness.

Korf opened the doors of a chamber built in the wall, entirely finished in rubber and provided with an airtight door.

"Two things (aside from cold, which can be overcome) seem to make a stay in space impossible for human beings: the absence of pressure and the lack of air. I am going to pump the air from this room, which really amounts to nothing more than a laboratory flask on a large scale, so that the interior will be like airless and pressureless space."

With great excitement the visitors watched Korf take from a drawer a bundle, which he opened up.

"This is a suit made of rubberized leather, like a diving suit, and absolutely airtight. By means of a special air magazine so much air is constantly produced in the suit that there is a constant pressure of one atmosphere, regardless of the external pressure.

"Perhaps one of you would be so kind as to put on the suit. Unfortunately, I cannot be the subject

of the experiment, since I have to manage the exhausts."

Uncle Sam surveyed the costume and the helmet which screwed on, but at once drew back when Korf nodded encouragingly to him. He was glad to leave it to the Russian to be the subject of the test.

Suchinow silently slipped into the costume and allowed Korf to screw on the helmet with the oxygen containers. Then he placed himself in the centre of the chamber. In one of his leather-covered hands Korf placed a burning candle. Then he closed the door, through the glass window of which all the proceedings could be witnessed. They could clearly hear an electric bell in the chamber, which Korf switched on.

The pump began to work. The candle flickered and went out. The bell seemed to sound fainter and fainter, though the clapper kept on striking. Korf shut off the pump.

"Now, except for weight and heat, the same conditions prevail in this chamber as in space. Yet Mr. Suchinow, with whom we cannot communicate at present, certainly feels all right."

Sam looked through the window and laughed out loud. In fact, Suchinow presented a very comical appearance. The suit had swelled to its fullest extent and had taken on a shape much like that of the favorite rubber dolls of festival times.

The expansive round figure in the chamber was walking back and forth, swinging its arms up and down, jumping in the air, shadow-boxing a little, and removing all doubt about its being in full possession of its powers.

Korf opened a little valve. The air rushed into the chamber, the bell sounded again, and the fantastic figure resumed its normal appearance.

"I congratulate you!" said Suchinow, when he had removed the suit. "It is very probably possible to remain in airless space in this pneumatic suit. But how do you propose to have a person move in space, since he is subject to no force of attraction and accordingly has no weight?"

"Certainly the absence of any pressure will at first be confusing to the passengers. Still we can get used to that. And after all it makes no difference whether the crew floats weightlessly about inside the ship or hovers like angels outside. There is in any case no weight. There is also the point that leaving my ship is absolutely essential in order to save the rocket; besides that, I intend to spend part, maybe even most, of the trip on the wings of the ship."

"Your ship has wings?" said Suchinow, passing to another point. "Why wings, which are entirely useless in space in the absence of a supporting medium, and only represent needless weight?"

"To be sure, the wings have no significance for the actual flight through space; they neither help nor harm. But even at the start they are a welcome aid to carry the space ship like an airplane above the lowest dense layers of air. Their most important function, however, is in landing. The ship on returning to earth enters the atmosphere at a cosmic speed and must be braked. If that is managed by simple recoil shots, landing would require the same tremendous amount of energy as starting. On the other hand, a space ship provided with wings can support itself in the air just like an airplane—first of all in the thin uppermost layers. It will enter almost parallel to the surface of the earth, keep sinking into denser layers, and gradually exhaust its speed by air resistance in as long a braking run as desired. Once its speed is reduced to two hundred meters a second, it can manoeuver like an airplane and come down in a gentle glide to any desired point on earth, that is to say, the starting place."

Korf's Purpose

VACARESCU had until now remained silent and had limited himself to listening to Suchinow's brief translations. Suddenly he stepped up to Korf and questioned him in French, a language which Korf understood very well but could not speak sufficiently fluently:

"Sir, what is the final purpose of your invention?"

"The final purpose?" answered Korf with gleaming eyes. "As my final purpose I intend to render the inexhaustible heat energy of the sun serviceable for mankind. Far out in space, at the limit of the earth's gravity, power stations shall arise, immense solar reflectors, making possible the concentration of gigantic amounts of energy at any desired spot on earth. The vast stretches of frozen polar lands can then be made fertile territory; fertile landscapes could be made barren wastes. Mankind shall be made independent of the decreasing coal supply of the earth, and any preparation for war can be nipped in the bud. Wealth and happiness shall come to the earth and let a joyful human race develop in unity and freedom. That, sir, is the final purpose of my invention!"

Old Sam did not trust his ears, when he heard these words. Was there more in Korf than just the cool and calculating technician?

"Gus!" said he, pressing his brother-in-law's hand. "Every day you furnish new surprises!"

"May I now invite you to follow me to the site of construction?" said Korf, turning to Suchinow, who was talking eagerly with Vacarescu.

On the landing place by the lake there was great activity. From a distance they could hear the concrete mixers. Little tipcarts rolled up to the separate points of construction and poured their moist contents into the forms. Most of the supports of the runway were already prepared.

Suchinow seemed greatly surprised at the length of the arrangement. But Korf reminded him with a smile of the airplane wings.

"For the starting giant airship," said he, "it is necessary to provide a correspondingly long runway. My rocket does not rise vertically but goes

up obliquely like any airplane. One hundred meters run, which is ample for an airplane, is naturally insufficient for a space ship with the dimensions of a Zeppelin."

Above the lower part of the runway the iron framework of the mighty space ship hangar was already erected, similar to great Zeppelin sheds but much wider, in view of the projecting wings.

As yet nothing was to be seen of the space ship itself. The separate parts were being constructed in various divisions of the Victoria works and in great measure had not even been begun, because of the lack of capital.

Suchinow asked another series of questions, part of which Korf answered evasively or not at all, when they concerned things which he thought he should keep secret. Nevertheless Suchinow was convinced that Korf's space ship removed all doubt as to the practicability of the plans made.

"Regarding business matters," said Korf, as the two foreigners were taking their leave, "I request you to discuss things with my representative, whose address you will find on this card. Dr. Kramer has all necessary instructions and power to settle matters."

With a cool ceremonial bow Vacarescu and Suchinow entered the automobile and drove off without turning around.

"Gus," remarked Uncle Sam, when the car had disappeared, "you are splendid! I simply wonder that this green-dotted Russian did not burst with anger. He must have seen that he can simply pack up his little rocket, when you get started."

"Do you think that this Vacarescu will really give the money?" said Korf, slightly worried.

"Gus, just let old Sam look out for such details. Do you think I have been travelling around for weeks, to let the man escape in the last minute? You just stay quietly at your construction work. I am going right over to see Dr. Kramer, and I shall keep my eyes on Mr. Vacarescu."

PART II

CHAPTER XIII

Ready to Start

MONTHS had passed. An unusually severe but dry winter had favored the work at Lake Constance. Even though Korf made the unwelcome discovery, while the work was going on, that he had considerably underestimated the cost, sufficient means were now coming in through subscriptions, which along with Vacarescu's loan eliminated all financial worries. The appeal from the skies had had its effect. The state also was now giving much assistance to the work by providing men who were out of employment, the state funds taking care of their pay.

Korf was tirelessly active. Being temporarily released from his position as chief engineer at the Victoria Airport, he could devote all his time and strength to the construction. It was due to his untiring zeal and his arrangements on a grand scale that the space ship was already close to completion by the end of January. Korf would not grant himself any rest, as long as he knew that Skoryna was in danger.

For almost five months the rocket had been circling about the moon, unchanged in its orbit. The horrible fate of the pioneer of spatial navigation kept the world excited.

Was he still alive? Asking this question was equivalent to answering it in the negative. Yet Korf did not give up hope.

No more light-signals from the rocket had been seen, though every observatory in the world was carefully examining the vicinity of the moon, when ever the space ship entered the shadow of either the earth or the moon. Accordingly Skoryna's fate was extremely uncertain, and the world waited impatiently for Korf's rescue expedition.

Old Sam, who had for the time being suppressed his wanderlust and rented furnished rooms near the airport, where he hoped to revive again his former medical practice, could not entirely hide his negative view regarding the question of spatial navigation. Nevertheless, he helped out, so far as he could, in speeding up the work and the preparations. For him the work was no longer a debatable incident of technical progress; it was the life work of his brother-in-law. Besides that, the enterprise had a noble humane purpose to fulfill, to which philosophical debates regarding timeliness and necessity had to yield.

When Korf began to collect the crew of the ship and sent Sam an official invitation to make the trip as ship's doctor, the old cosmopolite had a hard problem to solve. It was certainly not cowardice which made him hesitate in his decision; it was rather a drawing back before the grandiose immensity of the enterprise, the hesitancy of a proud and modest character at the threshold of prominence.

Korf knew how to clear up his doubts.

"Uncle Sam," said he one evening, when they were sitting together before the stove in Finkle's abode, "do you remember that splendid summer evening on the lake, shortly after your return, when you greeted the sunlit Zugspitze and were so hpapy to see your old home again?"

"Certainly, the evening was too beautiful for me to forget it ever."

"Do you recall that you spoke of an insignificant human being who rashly wishes to leave mother earth and of a breath which can extinguish this person out there in space?"

Korf had such a worried a look that Sam could not help grinning.

"Another reason for me to remain quietly on earth," he replied, with a face which tried to be serious. "Isn't it enough for one of us to be lost?"

Korf looked up in surprise. For some time Sam enjoyed his brother-in-law's amazement and then added:

"I understand all right, Gus. If you are putting

on such pressure, then—oh, well, for Heaven's sake build a little ice chest in your great palace and don't venture to nail up any placards with the enchanting wording: 'No smoking'!"

"Then you are coming along, Uncle Sam?" cried Korf joyfully, seizing his hand.

"What else can I do!" grumbled Sam, pulling his hand away. Then he went over to Mother Barbara's for a glass of beer, to think over the new state of affairs.

The last week before the start passed rapidly. First of all, the crew had to be trained and tested as to their suitability. Conditions were to be anticipated on the coming trip subject to which no person on earth had ever lived, the effect of which upon an individual's physical system no one could foresee. Even if it might be assumed that the absence of gravity during the free flight in space would produce no very disadvantageous results, there was the danger of the excessively increased pressure during the ascent. Since medical experience was not sufficient to express a certain judgment regarding physical powers of resistance to this unwonted phenomenon. Korf—to be absolutely sure—constructed a testing apparatus like a merry-go-round, on which the candidates were revolved at high speed in a circular path. In this case centrifugal force exerted a pressure on the occupants of the merry-go-round, which could be increased at will and observed in its effect on those being tested.

Thus Korf had selected a useful little group of ten aeronautical workers, all persons whom he had learned to know and to value as skillful and dependable during his years of activity at the airport.

As second navigation officer he took a well tried Zeppelin operator named Berger, who previously, when the *Z-R3* went to America, had for the first time conducted the taking of bearings by radio and had thereby won a name for himself. Berger gave a regular jump of joy when he was informed of his position on the space ship.

"Didn't I always say," he remarked radiantly to Korf, who on principle was taking only unmarried men, "marrying is a fine thing, if someone else is doing it!"

"Here's to true conradeship, Mr. Berger!" replied Korf. He knew that he could rely on this man.

The ascent was fixed for the third of February.

Days beforehand the starting place was continually surrounded by movie photographers, reporters, and curious persons, who occasionally sneaked through the fence and tried to get a closer view of the space ship. But the guards were on the watch and escorted every intruder none too gently from the forbidden zone.

Korf could no longer keep away from interviewers of all nations, who managed to find him everywhere and at the most incredible hours, until Sam offered to receive these people and to satisfy them on Korf's behalf. As a matter of fact, many newspapers published the yarns which Sam dictated to the journalists who wanted a sensation.

Final Inspection

AT last the expected day arrived.

Very early in the morning special trains from all directions brought huge swarms of people to the quiet little city. In dense unbroken lines the crowd poured out to the starting place, which was shut off in a wide enclosure by a strong body of soldiers and mounted police. Packed in further than the eye could see, the crowd pushed back and forth in a constant wavelike motion. The new comers pushed forward and did not let the lucky ones who were established on camp stools right behind the fence enjoy their favorable position. There was a constant crowding and pushing, so that often there resulted jams dangerous to life and limb, so the ambulance detachment had its hands full.

Yet the possessors of the best places could see nothing but the immense bare shed which concealed the space ship, together with the rails of the runway, coming from the end of the shed and spanning the depressions like a railway trestle in its course up the eastern slope.

The entire crew was already on board and was taking in the last supplies under Berger's command. Slowly the trucks crept through the screaming crowd and unloaded, before the little side door of the shed, chests, boxes, and bales, all of which disappeared one by one into the dark opening. After the baggage came a cage containing a pretty little parrot, Berger's mascot, which was uttering loud cries of protest. Last of all appeared a crafty movie photographer, who had hidden among the baggage, to take close-ups during the unloading, and was now protecting his booty amid struggles and yells.

Korf and Sam had kept the last few days on earth free and had gone out on the lake in a little boat. Silently they looked over to the snow-covered mountains and woods of their home and said a wordless good-bye. They were taking leave not only of their native mountains and woods but also of mother earth, of solid ground, of air and heat, of the realm of mankind.

What would the future hours bring? Victory or destruction? Would they ever again breathe the air of earth and feel the ground under their feet and sense the charm of fragrant spring? Or were they destined to die in darkness and cold and dreadful loneliness?

Were they to be like Skoryna?

The thought of this wretched being awakened Korf from his reverie. He shook off the soft emotions which were threatening to overcome him in this memorable hour of departure.

The early twilight of winter was commencing, when Korf and Sam made their appearance, accompanied by Director Heyse, a prominent representative of the government, and a small group of carefully selected newspaper correspondents. The

crowd became excited. "There is Korf!" went as quickly as lightning from one to another, and there was a thunder of applause as the inventor's car passed into the enclosure.

Berger stepped up to Korf. "Ready for the start!" he said in military style.

"Thank you!" said Korf, briefly but in a friendly tone. Then he led his guests into the shed, which was illuminated as bright as day by electric reflectors.

There lay the mighty space ship. It consisted of a gigantic steel hull, shaped somewhat like a cigar, ending in a blunt point with windows all around. The rear end of this giant cigar (half of it painted black, longitudinally, and half brightly polished) showed the opening of the exhaust pipe of the auxiliary rocket between the stabilizing wings. The men looked as tiny as ants beside the smooth hull of the fantastic flying machine.

At a sign from Korf the doors opened, dazzling lights flashed out into the darkness and driven by unseen forces the ship slowly began to move and glided majestically into the open on rollers moving on the rails of the runway.

A loud hurrah from the vast throng greeted the colossus as it glided out for its first emergence from the protecting shed. Then it stood still again, but within there was great activity. The wings moved and spread out to their full extent. The shining grub was unfolding its wings and becoming an immense dragonfly with three pairs of wings, one behind the other. On the point of the forward section the German naval flag was blowing in the breeze.

The onlookers became silent. This then was the fabulous machine about which all the newspapers had talked for months. This was the sky ship of steel and lead which was to carry brave men beyond their native earth, which was destined to realize the thousand year-old dream of humanity of conquering the sidereal world. German inspiration and German ability—would they conquer the might of the earth and the sun?

Korf led his guests into the interior of the forward section of the ship by way of a gangplank which was quickly set up. The opening in the steel wall led to a small chamber the size of an elevator.

"This chamber," the engineer explained, "is the one and only entrance to the parts of the ship which are at all accessible. Its two pneumatic doors make possible during the flight leaving the ship in this manner: first coming into the chamber through the inner door, then closing this door and opening the outside one. Thus, during the entering and leaving the air pressure in the interior is not affected. Naturally it is not possible to leave the ship without a 'space' suit. The absence of pressure in space would at once kill a man."

Through this chamber the guests reached a circular room illuminated with electric light, a sort of vestibule or hallway.

"This is the centre of the forward part of the ship," continued Korf, in the course of his explanations, "around which are located the cabins, lavatory, dining room, smoking room, and electric kitchen. Below are the tanks of the hydrogen rocket."

"Below?" inquired one of the reporters, doubting whether he had heard correctly.

"That is so," said Korf with a smile. "I must first explain to you what is meant here by the terms up and down. By 'down' we naturally mean the direction in which pressure acts; during the ascent, as long as the rocket is in action, that is the direction from the bow to the exhaust. In our language on shipboard, therefore, the bow is always 'up', and the exhaust pipe, the rear end of the ship, is always 'down'. Of course this seems strange to you, now that we are in a horizontal position. But if you want to hold fast to the idea of 'up' and 'down', the longitudinal axis of the ship is the only guide to a vertical direction. In the present gravitational conditions the position of the tanks could be better described as 'behind the cabins'. Moreover, these tanks, together with the vaporization chambers and the exhaust pipes, are not accessible from within and are managed from the control point by means of electric control."

Korf turned to a circular passage which opened into the central room.

"This passage leads to the extreme tip of the ship, that is to say, 'up', in our vocabulary."

Cautiously the men passed through the opening.

"But if the passageway is pointed upward," put in one of them, "I do not understand how. . . ."

"How anybody is to go up and down, you mean? You will find no steps anywhere in the entire ship, only easily movable rope ladders, which can be put up in case of need. You must not forget that the greatest part of the trip takes place in partial or complete absence of weight. Steps would then be only hindrances. Solid hand-holds on all the walls and floors are the best aids to progress from one point to another. During the ascent, the only time when there is a real and powerful pressure downward, nobody has anything to do in the passages."

Last Moments

IN the meantime Korf and the visitors had reached the tip of the ship, an odd looking room located at this point, resembling in form a truncated cone, the round walls being equipped by strong glass windows all around.

"Here is where the ship is controlled. The multiplicity of apparatus which you see fastened to the walls here with strong springs, I cannot explain in much detail in the short time available. In the main switchboard the wires of all the measuring devices come together, the results of which are registered by electric currents. A gyroscopic system, in place of the compass which is of no use here, shows the momentary position of the ship and its changes in direction. Three pressure springs, corresponding to the three coordinates of space, reproduce the components of acceleration which are likewise car-

ried by electric currents to measuring instruments and combined by automatic planimeters. Other apparatus automatically calculates from the acceleration the speed attained and consequently the distance travelled at any time. A series of scales, connected with the manometers, hydrometers, and the exterior aneroid barometers (all of which are built into the ship at various points), give a complete and easily observable picture of the entire pressure condition both inside and outside the ship. The equipment for navigation is supplemented by optical and astronomical instruments of special kinds. The various levers and switches control the wings, the stabilizers, the pumps, and various other apparatus. With a slight touch the entire ship may be controlled.

"The most important device is this strong lever, which controls the access of fuel to the exhausts. It is, so to speak, the gas lever. Above it is the scale, the pointer of which indicates the absolute acceleration at any moment. The brilliant red line upon it is the marker of the border line between life and death. As long as the increase in speed per second is below forty meters, there is no direct danger to the lives of the crew. But if the pointer rises much above this limit, which is sharply indicated by the red line, we shall in all probability be crushed by the frightful pressure."

With a slight shudder the guests examined the scales and levers and carefully refrained from touching anything. Great drawing boards with conic section curves, serving for sketching in the flight curves, stood on rotary stands, every bit of solid wall being utilized.

"In the most extreme, that is to say highest, compartment of the tip," said Korf, "a parachute of one hundred and twenty square meters surface is placed, folded together closely. In the most extreme peril, if the engines do not work on landing on earth, it can hold the crew and preserve it from the crash. But I hope that it will never have occasion to be used."

Meanwhile it had become six o'clock.

"Unfortunately I must now ask you to leave the ship. We have only twenty minutes more."

They heeded this request only very unwillingly. There were still so many unanswered questions about the air supply, temperature, steering, the course of flight, and so on. Nevertheless Korf would not give any more explanations and repeated his insistent request.

"Gentlemen," he said, watch in hand, "every second of delay in starting will alter the course of the ship and put off for days the rescue of the rocket. I beg of you to consider this!"

When Korf again appeared on the gangplank, there was a new outburst of enthusiasm. Vainly he tried to quiet the crowd; it was absolutely impossible. He gave up the idea of a speech and took leave of the guests of honor with hearty handshakes.

"Gentlemen," he said simply, "please transmit to mankind my thanks for the active support of my enterprise. I hope that my ship will justify the confidence reposed in me."

Then a member of the crew passed around a tray of full champagne glasses and quickly disappeared again into the door. Korf raised his glass, and his words rang out loudly and clearly over the wide space:

"As once Geryon, the three-headed winged monster, conducted Dante across the abyss of Hell, thus will *Geryon*, the three-winged space ship, carry us safely over the abysses of space.

"Accordingly let *Geryon* be the name of my ship! —Till we meet again!"

The glasses crashed on the ground, Korf cast off the gangplank, the door closed, the flag on the bow of the ship was taken in, and the reflectors sending lights from the shed were extinguished.

A breathless stillness lay upon the multitude. All eyes were fixed on the monster which was hardly visible in the dusk. Suddenly it glowed in a bright white light; the illumination tubes on the surface of the hull had been switched on. The brightness of day shone over the great enclosure and dazzled the eyes of the onlookers.

After a few seconds there sounded a shot, the signal arranged for the start.

The gigantic flying machine trembled, and a shrill screaming sounded over the fields, so that the people ducked their heads in terror. The upper two auxiliary exhausts had been started, spitting out behind them conical streams of fire. Slowly the space ship moved onto the rails of the runway—slowly for just a moment, for then it was off in a mad dash.

Into The Infinite

QUICKER and ever quicker the ship rushed ahead. After a second it was taking the incline. It raced up the slope with a speed many times that of an express train. In ten seconds it was past the kilometer mark—and now the brilliant gigantic butterfly was rising, freed from its rollers, freely floating into the night.

It was an overwhelming sight! A sea of yellowish light flooded the densely packed multitude. An outburst of thunderous applause followed the space ship.

As though lifted by spirit hands, the fiery figure sped obliquely upward in its mad course.

Then a thundering and rattling rent the air, so that the people tried to flee in panic terror. Horrified wide open eyes stared at the uncanny spectacle in the air. The rocket was operating at maximum power. The immense main exhaust had flamed out, and a gigantic trail of fire stood out like a comet's tail behind the speeding ship.

A glistering spark fell, already far beyond the chain of hills which framed the eastern shore. It was a little parachute carrying a dispatch box, the last direct greeting of the vanishing *Geryon*.

Nobody heeded it. All eyes were fixed on the

fiery comet which, though the work of human hands, was making its luminous path across the evening sky.

The starting place sank into darkness. In the far distance the space ship was floating away, already too remote to illuminate the earth any longer. It cast a ghostly reflection in the waves of the lake.

As yet two minutes had not passed. The *Geryon* now seemed to the beholders nothing but a glowing dot. Then the trail of fire blazed out anew.

Councillor Heyse looked at his watch.

"Ninety-eight seconds!" he said to his neighbor. "Korf has just cast off the burned out auxiliary rocket and started the second alcohol rocket."

"About how far is the ship now?"

"There might be ninety kilometers between it and us at present."

"Incredible!" murmured the other. "From Lake Constance to Munich in two minutes!"

"I estimate the *Geryon* now twenty thousand meters above the central Alps. The highest peak of the Himalayas cannot rival that height."

After three more minutes the space ship was visible only to very good eyes as a faint dot on the southeastern sky. It might perhaps be seven hundred kilometers from the starting place.

"Now the ship is racing through the last part of the terrestrial atmosphere. The wings have done their work, for the time being."

The reporters crowded around the director of the airport and carefully noted what he said.

Good field glasses still permitted observation of the ship for some time. Then the dot in the heavens vanished. Only the few lucky possessors of a very powerful telescope could follow the *Geryon* any further in its path, which turned more and more to the south, until at about one o'clock it went behind the wooded heights of Rohrschach, looking at the time like a very faint star in the southwest.

"It is incomprehensible!" said Director Heyse, as he was going home. "Just a few hours ago I was standing in this space ship, which now, as a tiny fragment of the earth out in space, is floating between our planet and the moon!"

On the next morning the newspapers had long accounts of the start and the course of the space ship.

"Even if the *Geryon*," it was said there, "seems to move around the earth in a constantly widening spiral, which is an illusion caused by the rotation of the earth, all the observations indicate that its path is exactly in accordance with the predetermined S-shaped curve of ascent and is directed toward the constellation Aquarius, into which the moon will also enter in three days."

During the first half hour of the ascent some radio messages had been received from the *Geryon*, stating that so far the trip had gone smoothly and without any trouble and that the crew was all right. But these messages had soon ceased, since the transmitter of the space ship could not reach more than six thousand kilometers at most.

On the following evening, at exactly the same time as the start, the *Geryon* reappeared in the eastern sky. But now the little telescopes and other aids to vision were useless. The public had to depend on announcements from astronomical observatories, whose great reflectors easily made out the space ship, now at a distance of almost fifteen diameters of the earth.

Again it rose higher in the heavens, crossed the meridian, and inclined toward the southwest. But before it reached the horizon, the tiny dot suddenly vanished and was seen no more.

Panic terror seized the world, when all the observatories sent announcements agreeing that the *Geryon* was no longer to be found in the sky. There was still hope because of the Suchinow rocket, which had so long remained undiscovered while within the shadow of the earth. People tried to calm themselves by assuming that Korf had doubtless shut off the external lights, in order to save energy.

But on succeeding nights, also, the *Geryon* was no longer visible in the heavens. Even the greatest observatories could no longer see anything.

What had happened?

Horror seized mankind. Had infinity swallowed up a second sacrifice as well? To be sure, every night they hoped that the extinguished spark would shine forth again——but in vain. Korf's space ship had disappeared.

Korf and his faithful men and Skoryna also were regarded as lost—lost forever. A great depression prevailed on earth.

CHAPTER XIV

First Moments

WHEN Korf, after the christening of the *Geryon*, had cast off the gangplank, he closed both the outer and inner doors very carefully and then hurried to the control room, where Berger was standing at the central switchboard looking at the chronometer.

"Are you all ready for the start?" asked Korf, casting an eye at the instruments and switches.

"Two men are at the generator, one is watching the gasifier, and two are here ready with the flight curves. The other five are at rest, but I am afraid no one is closing his eyes."

"I imagine not. As soon as we are having a free run, you will also be off duty, Berger." Korf looked around. "Where is Dr. Finkle?"

"He is getting settled in his cabin. Shall I ask him to come to the carrousel?"

Korf nodded and got into his hammock, which was so placed that he could manage all the important switches while lying down. The carpets which had hitherto covered the curved floor had been removed. During the ascent this "floor" would of course become a wall, as soon as the pressure of

acceleration overcame that of the earth's attraction. The circular "wall," now behind, would then form the bottom of the room, which was traversed in the middle by a strong round wall, for the switching apparatus. This room resembled a "carrousel" or merry-go-round, closed in on all sides and now lying on one edge. Consequently the name "carrousel" had already become part of the vocabulary of the ship.

Sam appeared in the carrousel.

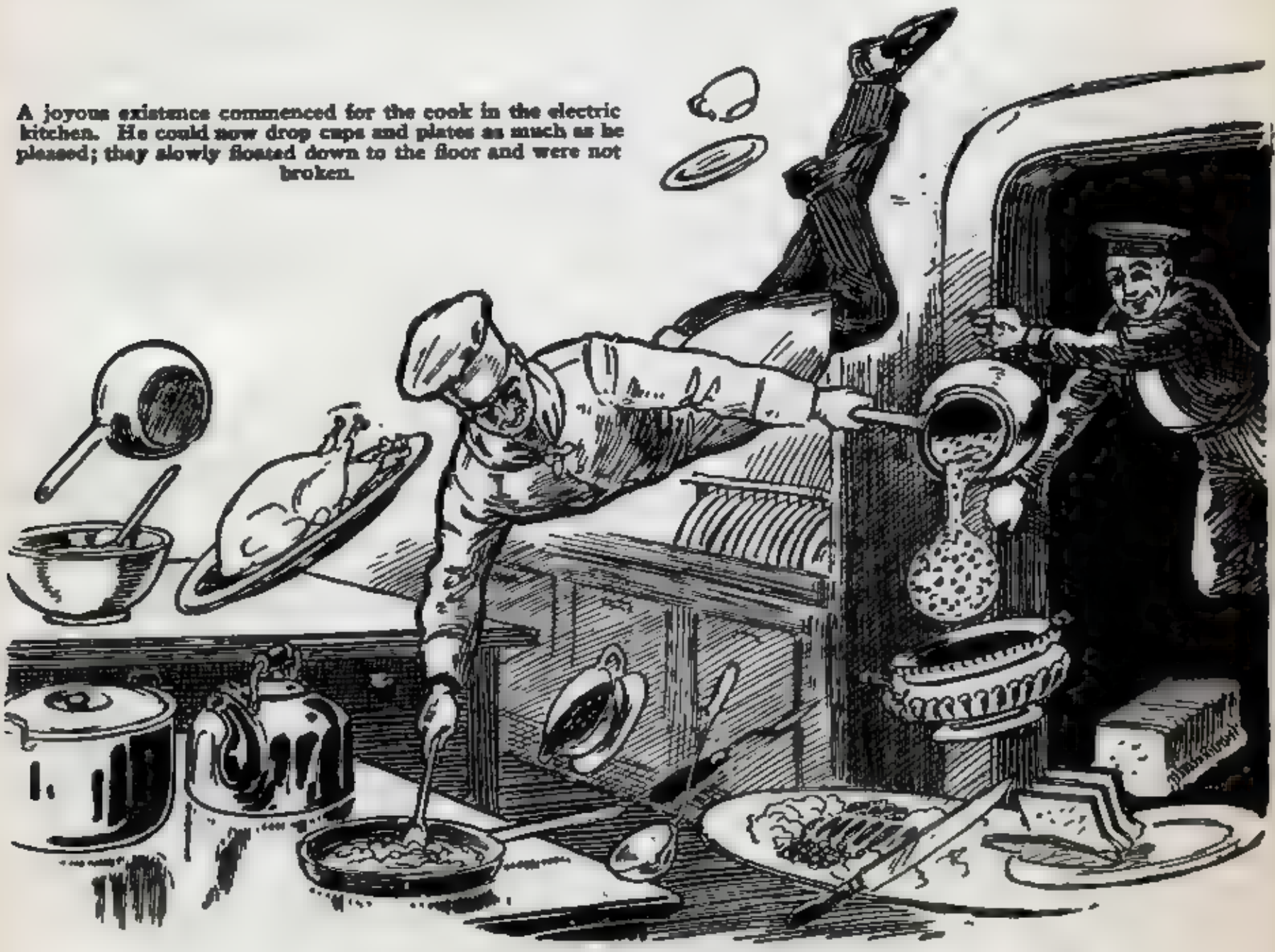
"It is really a very comfortable coop which you assigned me, Gus! I feel at home in it already. It is a bit narrow, of course, and I shall have to get used to the hammock way up in the air, but. . ."

"Switch on the outside lights!" The order rang through the speaking tube without the slightest trembling of the voice to betray any excitement at the greatness of the moment.

One last glance of examination of the travellers in the carrousel, all lying in their hammocks, and then Korf's eye did not leave the chronometer.

Thirty-two minutes past six. The second hand jumped further—two—five seconds.

Sam squinted sideways through the windows. His glance travelled over the starting place and the crowd of people. He saw a wave of excitement run through the crowd; he saw the emotion of the brightly-lighted faces. No sound, however, entered



A joyous existence commenced for the cook in the electric kitchen. He could now drop cups and plates as much as he pleased; they slowly floated down to the floor and were not broken.

"You will enjoy making the ascent here, I am sure!" interrupted Korf. "Please get quickly into the hammock! In two minutes the exhausts will begin to operate, and then woe to anyone who is standing up."

In fright Sam obeyed and climbed into the swaying net.

"All right?" Korf called through the speaking tube to the lower rooms.

"All right!" was the calm reply, as though it were merely the question of an ordinary Zeppelin flight.

the hermetically sealed ship from without. Only the measured throbbing of the motor which ran the lights and the high pitched song of the generators came from the engine room to his ears.

The hand progressed—twenty—thirty seconds.

Korf's fingers moved toward the gas lever, touched it, and rested calmly on the handle.

As though hypnotized, Sam stared at the sinewy hand which in the next moment was to snap its fingers at the supreme power of the earth. He actually felt the firm pressure of the fingers on the lever. At lightning speed the events of the last

few months passed before his mind's eye—the cares and worries of his brother-in-law, the hunt for Suchinow, Vacarescu, Natalka. . . .

Forty seconds—forty-five seconds—

Then the leader's hand moved. A push of the lever, and something like distant thunder shook the ship. The chronometer sprang back to zero. The hammocks swayed.

The flight into infinity had commenced.

Outside the starting place was passing by; for an instant Sam saw hats and handkerchiefs waving in a tumult of enthusiasm. Then in the light of the ship, shining tree tops raced by. Further off were the silhouettes of the houses of Friedrichshafen, and behind them the surface of Lake Constance gleaming.

Korf moved the ascending control, the wings became oblique; the ship left the ground and rose into the air.

The lower windows were free. A brilliantly lighted strip lay below the ship. The ground seemed to rush back, sinking lower; it shone more weakly and disappeared. Outside the windows it was black night.

Now Korf gave full gas to the main exhaust. The thunder of the expulsion increased, becoming a roaring and crackling, like Hell broken loose. The acceleration indicator crept up the scale and wavered at the point twenty.

Sam was groaning in his hammock, with a tremendous weight pressing on him and squeezing his throat.

Pressure!

Creaking, the springs of the hammocks stretched. The cords tightened around the bodies, which were pulling downward with increased weight. Exhausted, Sam lay in the net, his glance directed straight upward. It was strange—the windows through which he had just been looking at the starry sky were sinking down sideways, while the circular forward wall was approaching and cutting off the view.

With trouble Sam turned his head. In truth, the arched wall of windows now surrounded him on all sides, with the flat circular "floor" above and below. The carrousel had assumed its proper position.

Thirty more seconds passed.

"Gus!" panted Sam.

"Yes, Uncle Sam?"

"Do you see that dim constellation out there sideways, at the same height as ourselves? There is a yellowish glow all around it. I never saw such an uncanny looking constellation."

Korf cast a rapid glance through the window. "Constellation?" He read the altimeter. "Presumably this constellation is Munich!"

In amazement Sam wanted to get up, but the tremendous weight threw him back.

"Munich?" he groaned. "Have you lost your senses? Since when did cities stick up on the sky?"

Korf did not answer. He was fixedly regarding the acceleration scale, the indicator of which was slowly receding.

"The auxiliary rocket is burned out, Berger. Uncouple it!"

Berger's hand had already been on the handle. A slight pressure, and the mighty ship had divided. In an oblique course the uncoupled rocket rushed back to earth.

Quickly Korf's hands were busy at the gas levers.

"Look out, here comes full gas on the middle rocket!"

The indicator rose again, crossed twenty, hastened by twenty-five to thirty—thirty-one—and wavered at thirty-two, where it stopped. The brilliant red line was at forty.

Three Minutes

THE pressure became intolerable. The hammocks sank deeply; the pressure on the men's chests was growing to be frightful. Sam could scarcely breathe now. He tried to raise his hand, but he succeeded only with a great effort, and his arm sank back exhausted, striking his body heavily. It seemed as though mercury were flowing in his veins instead of blood, as though every limb had become four times as heavy, as though four strong men were lying on him and holding him fast. The cords of the hammock were cutting through the pads laid on them, and his back hurt.

Sam asked no more questions. He was struggling for air. His lungs could scarcely raise the weight of his chest. For a time he struggled against the oppressive weight of his limbs, tried to say something, to cry out, then he sank back irresolutely, overpowered by the uncanny force. He could no longer even desire anything or think of anything. His mind was enveloped in twilight.

Korf was also suffering a great deal from the pressure. Reaching to execute the few simple manipulations of the apparatus became a test of strength. Only with the most extreme effort did his muscles succeed in extending his arm, to bring his hand to the lever.

The speedometer indicated six thousand meters a second. Again the acceleration indicator moved back.

"Detach the alcohol rocket!" mumbled Korf.

For the second time the ship divided. The pure hydrogen rocket flamed forth and spit its glowing vapors backward at an incredible speed.

The indicator came dangerously close to the red line. The machine was developing its highest power.

Only five minutes had actually passed since the start—an eternity to the crew. The raging noise of the exhaust was silent. The *Geryon* was already racing through heights, the unusually thin air of which could no longer convey sound.

There were still three minutes to hold out; then the speed would be attained which would carry the ship outside the limits of the earth's force. The speedometer rose evenly — seven thousand — eight thousand meters a second.

A horrible thought passed through Korf's mind. What if he did not manage to summon up strength enough to depress the gas lever!

Then with the high acceleration the speed would keep increasing more and more, until at length even the mighty supplies of the hydrogen rocket would be exhausted. Then, without any fuel at all, there would be no return possible. The ship would be precipitated beyond the orbit of the earth, rushing through the planetary realms in a mad course—on a hyperbolic path, running into infinity. In less than half an hour a speed would be reached which would carry the ship for ever beyond the solar system.

It was the seventh minute. The speeding ship traversed nine thousand meters every second.

Slowly and painfully Korf raised his arm, supporting it wearily in one of the slings hanging down from the ceiling. There was only a hand's breadth between his fingers and the gas lever. Painfully Korf fought for every centimeter. His strength threatened to leave him. For a moment he paused exhausted.

The instrument pitilessly announced a speed of nine thousand eight hundred meters.

Great Heavens, only two seconds remained! A push forward, his hand grasped the handle, and the lever flew back.

Cold sweat stood on Korf's brow. The fearful exertion had used up the last remnant of his strength.

The acceleration indicator sank, crossed the twenty line, went below ten, and settled at the line marking three meters a second increase in speed.

The pressure sank as rapidly as it had come.

The chronometer showed eight minutes.

CHAPTER XV
Beyond the Earth

FOR a while nothing stirred in the "carrousel". The silence was broken only by the heavy breathing of the five men.

Sam opened his eyes and looked about him. The lights were burning, and the windows were black yawning gulfs like the open jaws of beasts of prey.

He tried to sit up. He could do so: the mercury in his veins was gone. Comfortably he stretched and turned. It was a pleasure to be able to move again, to have once more attained mastery over his muscles. He drew a breath of relief, as after waking from a bad dream.

"Gus!" he cried. "Where are we now?"

There was no reply.

He climbed out of the hammock and walked over to his brother-in-law, stepping cautiously and testing the reliability of his legs. But what was this? He could hardly keep his balance. At any quick motion he threatened to fall over forward. He felt that he was remarkably light. Or was it the natural reaction from the dreadful pressure that still hurt all his muscles?

Korf lay bathed in sweat. Anxiously Sam rubbed his temples and held a bottle of camphor below his nose. Slowly Korf opened his eyes and gazed around uncomprehendingly. It was only a second before complete consciousness returned to him.

He first glanced at the chronometer. It showed twelve minutes. Quickly he jumped up. Berger and the two members of the crew had also recovered themselves.

"The hammocks can now be rolled up!" he called to Berger and then began to study the curves of the recording instruments.

"What a trip!" remarked Sam. "I shall never forget those eight minutes in all my life. All my bones hurt." He felt himself all over carefully. "Nothing seems to be broken."

"Yes, in the long run no human being could endure this pressure. Just take a look below, Berger, to see whether everything is all right."

"Gus!" began Sam, when Berger had disappeared. "Where are we now, really?"

Korf inspected the instruments. "Six thousand kilometers headway and almost four thousand in altitude."

"Four thousand in altitude?" repeated Sam. "And Mt. Everest has nine thousand. Well!"

"Yes, but that is in meters! Our unit is the kilometer!"

"Good Lord!" cried the physician. "Then we are —why, we are four hundred times as high as the loftiest point on earth!"

"Certainly!" Korf smiled. "The barometers outside have long been at zero. The atmosphere of the earth is already far behind, and we are now floating in space."

Berger reported through the speaking tube. "All right below! The dispatch box was released after fifteen seconds. The last radiogram has just been sent!"

"Very good, Berger, you may now go off duty."

Sam stood at the window and stared out into the black night. "Then we can't see anything more of the earth?"

Korf stepped to his side and adjusted the telescope.

"If you pay good attention, now and then you will be able to make out a gleam of light—perhaps the reflector of some lighthouse or else light signals from a steamer floating down there on the Pacific."

"The Pacific?"

"If it were bright, we could now see the earth from the Philippines to the east coast of France. Apparently we are now approximately over the Persian Gulf."

"Please point the telescope at Bombay for me. I should like to take another look at the place where I lived so long."

Korf laughed loudly. "You are asking a good deal, Uncle Sam." He adjusted the telescope again. "The Indian Ocean must be somewhere in this direction. Perhaps you will succeed in making out the yellow light of the illuminated city. Here's luck to you! But do not imagine that you can influence the night life of India from here."

The telescope was almost horizontal, with a slight inclination downward.

"Bombay, Gus! I want to see Bombay, not Mars!"

"Well then, look through it!"

Sam stepped back in amazement. "Are you trying to make a fool out of me? The earth is down there!" He made a couple of violent gestures with his hand toward the floor.

Korf winked at him, much pleased. "Certainly, Lake Constance is there."

"Well then!"

"And where do you suppose the centre of the earth is to be found?"

"The centre of the earth? I have never been there, but I suppose it is still lower down than Lake Constance."

"There, then!" Korf imitated Finkle's gestures.

"Naturally! Where else?"

"Over there, Uncle Sam!" He pointed obliquely out of the window. "There is the centre of the earth, and in front of it is the Persian Gulf, over which we are at present."

Sam's mouth remained wide open. "The earth up there in the sky?"

"Do not forget," Korf explained, "that we rose at a very acute angle, almost parallel to the surface of the earth. Accordingly we must look for the earth off to one side. The pressure which makes us feel the long axis of the ship to be vertical does not come from the earth but from the force of our rocket exhaust pipes."

Finkle's head went around like a mill wheel.

"If we had risen on the sunny side, that is to say, in the daytime, we could now see the surface of the earth beside us. The northwest edge of the globe would be exactly at our feet, the southeast edge on the contrary would appear almost level, and the entire visible surface would include an angle of almost ninety degrees. Unfortunately I cannot provide you with this doubtless grandiose view."

"Then why didn't we ascend by day?"

"Out of regard for terrestrial observations! In that case we should have been somewhere between the earth and the sun during the entire trip and could not have been seen from the earth."

Korf Stands By

KORF busied himself with the flight curves and left Sam to his thoughts, which were extremely confused. He stared out into space and tried to represent to himself that over there in the distance was solid ground, with men standing and walking there and never once having the idea of puzzling out whether their legs actually did point to the centre of the earth.

After a pause he remarked, "Surely millions of eyes and hundreds of thousands of telescopes are now pointed at us, staring after the speeding point of light. And when I think of the millions of chilly feet and the epidemic of headcolds which will rage tomorrow down there or over there, I think it is a matter of common politeness to answer their attention a bit. You are acting just as though the world had already ceased to concern you."

"Dear Uncle," replied Korf with a smile, "the indications of my instruments are incomparably more interesting and important to me than the black night out there. It will doubtless suffice if you take over this duty of politeness—but I hope not in respect to the cold feet."

"I should say not. On the contrary, I find it actually uncomfortably hot here," groaned Sam. "Can't you have the heat shut off a little?"

"Not this heat, unfortunately. It comes from outside."

"From outside? I thought it was cold in space."

"Certainly! But this heat came from the friction of the air on the outer wall of our ship as it shot through. For your comfort I can assure you that this incubator temperature will not last long. Besides, it has already decreased considerably."

Korf again called Berger. "What is the temperature down there?"

"Thirty-three degrees Centigrade."

"Well, the thermometer up here indicates thirty-eight. Have some liquid oxygen sprayed around and have the excess-pressure valves opened for a short time."

The heat was actually intolerable, and the evaporating oxygen brought only slight relief.

Sam yawned to his heart's content. "I am surprisingly tired!" he remarked, wiping his forehead. "I do not know why, but I feel as though I had been out all night on a spree. But we have been less than half an hour on the way."

"It will be all right for you to go to sleep, Uncle Sam," said Korf, who knew that this fatigue was not merely due to the heat. "When you wake up again, there will be no more of these unpleasant phenomena which the earth has presented us on parting. For the present there is nothing to be seen but black night. Sleep well, uncle, and if you need anything, ring for the orderly."

Yawning wearily, Sam climbed down the swaying rope ladder, crossed the central room, and entered his cabin. The inviting white hammock attracted him very much, and before he thought of undressing, he sank down and fell at once into a dreamless sleep.

Korf remained at his post, although he had to struggle against the uncanny weariness and limpness of his limbs and suffered from the breathless heat. But as long as the *Geryon* was still floating within the earth's region of power, he dared not entrust the observation of the instruments to anyone else. Data had to be assembled for the future landing manoeuvers, and the least negligence might lead to serious consequences.

From time to time he depressed the acceleration lever. The pressure decreased proportionately and all objects lost weight. He could have shut off the exhaust completely, since the *Geryon* had long since attained the speed which would safely take it from the reach of the earth. But Korf was insistent on reaching his goal as quickly as possible. He did not give up the hope of finding Skoryna still alive. Perhaps his spark of life was actually at the point of being extinguished, and one single moment sooner or later might decide matters.

The night continued, and the clocks showed the sixth hour since the start. Seventy thousand kilometers, almost double the circumference of the earth, separated the crew of the space ship from mankind. Unchanged deep night surrounded the ship, and nothing more was to be seen of the earth. Only a wide starless place indicated the spot where their native planet was floating.

"Now the presses of the morning papers are working," thought Korf. "People will struggle for the sheets still damp from the press and will eagerly wait for messages from California, in the field of vision of which we now are."

More and more the ship radiated its heat into space. Again they felt free and easy and took a breath of relief, as though a tremendous pressure had been removed.

Korf smiled as he thought of the surprises in

store for all of them in this matter. Since no more danger threatened the *Geryon*, which had escaped from the earth, he no longer hesitated to be relieved by Berger and to take a few hours' rest.

CHAPTER XVI

A New Day

WHEN Sam awoke, his first glance was at his watch. "Nine o'clock?" he reflected. "What does that mean? Nine in the morning or nine in the evening?"

He quickly performed his toilet and rang for the orderly.

"Just tell me, what time is it now?"

"Half past fourteen."

"What!"

"Half past fourteen, doctor. Here time is reckoned from the ascent and the hours run from zero to twenty-four."

"Where is Mr. Korf?"

"He is sitting with Mr. Berger in the carrousel and has several times inquired for you, doctor."

Sam hurriedly drank his coffee and then hastened to the control room. Everywhere electric bulbs were burning. There was no sign of daylight.

"Well, that's what I call sleeping, Uncle Sam!" was Korf's merry greeting. "You did not get bed sores, did you?"

"Far from it! I feel wonderfully fresh and gay, and it seems as though I had become ten years younger by this sleep. Have I really slept so long? The boy told me it was fourteen o'clock. My watch says nine, and the night is not over yet. I am now quite lost in the calendar."

"Yes, Uncle Sam, by Friedrichshafen local time it is now certainly nine o'clock. But you had better set your watch by the ship's time. It is foolish to reckon here by the local time of some spot on earth."

"When is it really day in this gloomy region?" asked Sam, who was walking up and down with long springy strides. Occasionally he had to catch his balance in order not to fall.

"As soon as the sun is no longer hidden from us by the earth. That may be in about four hours. In the meantime we must be satisfied with the light of the stars and the moon."

Korf turned out the electric light. Still it was not absolutely dark in the room. There came in at the side a faint silvery light, which cast great shadows and would have sufficed for reading a newspaper, in case of need.

"Yonder is the moon, though only the half disk. If it were full, we could not complain about darkness. The stars also give a perceptible illumination."

In fact the stars were radiating a quiet even light, without twinkling, much brighter than on earth, because there the dense atmosphere absorbs a great deal of the light.

"It is not so simple to find your way here in the sky," continued Korf. "The constellations familiar to us are almost effaced by the great number of small faint stars which on earth cannot be seen with the naked eye on account of the air. In this swarm back there," said he, pointing diagonally upward with his hand, "you will recognize with some difficulty the constellation of the Little Bear (Little Dipper), in the tail of which is the pole star, around which the entire sky seems to revolve, as viewed from the earth. For us it has lost its central position and remains only a welcome aid in locating the axis of the earth and thereby the earth's orbit, the ecliptic."

In a hasty sketch he further explained the paths of the earth, the moon, and the space ship. Sam was amazed.

"Then the rotation of the sky has ceased for us?"

"As long as the *Geryon* does not rotate," Korf agreed, "no star either rises or sets for us. Of course the moon does not, either, or for that matter the sun, once it comes out from behind the earth."

"Vitruvius once said: 'The sky is that which unendingly revolves about the earth and the sea on a fixed axis.' With this idea the good man went to his grave, and for centuries he was regarded as one of the world's wise men. It is too bad that we cannot invite this learned man to visit us for a quarter of an hour. He would experience something!"

Berger interrupted the conversation: "Shall I check the speed still more, Mr. Korf?"

"What is the speed?"

"Two thousand meters a second."

"For the present let the upper auxiliary exhaust work with one-quarter power. Otherwise the speed would decrease too rapidly."

"Two thousand meters speed?" put in Sam. "Isn't that a good deal less than right after the start?"

"Certainly. At the end of the eighth minute we had reached the parabolic speed suitable for that altitude, ten thousand meters a second. Naturally this speed does not remain constant, but decreases under the influence of the attraction of the earth, at first quickly and then more and more slowly, just as with a stone which is thrown up in the air. But before it is entirely used up, the limit of gravity between the earth and the moon is reached—that is to say, the distance from the earth at which the attraction of the moon begins to be stronger. Then the ship does not fall back to the earth but to the moon.

"This is the whole secret of pushing out into space, just giving a ship this parabolic speed. Then the flyer goes on by itself."

"Well, that is very simple! But why don't we feel anything now of the speed which is still great?"

"What we so keenly felt during the ascent was the *acceleration*, not the speed, which is not at all perceptible. In your consultation room in Friedrichshafen did you ever feel that you were at all times going in the earth's orbit around the sun at the frightful rate of thirty kilometers a second?"

"Does the earth travel thirty thousand meters a second?" Dr. Finkle became eager, and his interest in astronomy took a visible increase.

"A splendid speed, isn't it?"

Sam's brow wrinkled. "But it doesn't agree, Gus!"

"How so?"

"Where are we going to arrive with our *Geryon*, which is now making only two thousand meters a second, if I just heard correctly? Won't we be so far behind the speeding earth in a very few minutes that catching up will be out of the question?"

"At the first glance, Uncle Sam, what you say seems to be correct. The circumstances are even more unfavorable. It is not only the earth that runs away from us, according to your theory; it is well known that the sun, also, along with all its planets is moving away in the direction of the constellation Hercules, this being at a speed of about twenty kilometers a second."

"Good Heavens, where are we going to arrive?"

"And if we assume," Korf proceeded, "that the sun likewise rotates about a centre which is also moving, then the whole business becomes very complicated, doesn't it?"

A Stowaway

THERE was a roguish smile on his face. Sam thought hard. He could find no other solution than that the "Geryon" needed to go faster than two kilometers a second.

"Don't wrack your brains any more, Uncle Sam! I frankly confess to you that I myself have no idea at what absolute speed, in case there is such a thing at all, our ship is travelling in space. It does not matter at all."

"It matters to me whether Mother Earth escapes us for ever or not. I should not care to stay for all time in your splendid machine, travelling about in the least known regions of space."

Sam seemed to feel a little discomfort, though he said to himself that there must be some error in his calculation.

"Don't worry! The earth is not getting away from us. How shall I explain it to you? In the earth-moon system we have the speed calculated and for the time being nothing else concerns us. You will best understand by an example."

Korf reflected for a while. Then he continued:

"Imagine a dining car in a Pullman train. On the ceiling of the car is an electric fan. On this is a small caterpillar. Do you follow me, uncle?"

"Up to this point!"

"All right! This caterpillar now crawls from the extreme tip of a blade of the fan to the hub at the maximum speed that it can attain by crawling. It will then reach its goal in a very definite time. It does not need to bother its head about describing a spiral course on account of the rotation of the fan, besides being moved forward by the motion of the train, whirled around by the rotating earth, carried along in the orbit of the earth about the sun, and so on.

"Well, just tell me the absolute velocity of the caterpillar and the kind of curve in which it moves!"

Sam scratched his head and did not reply.

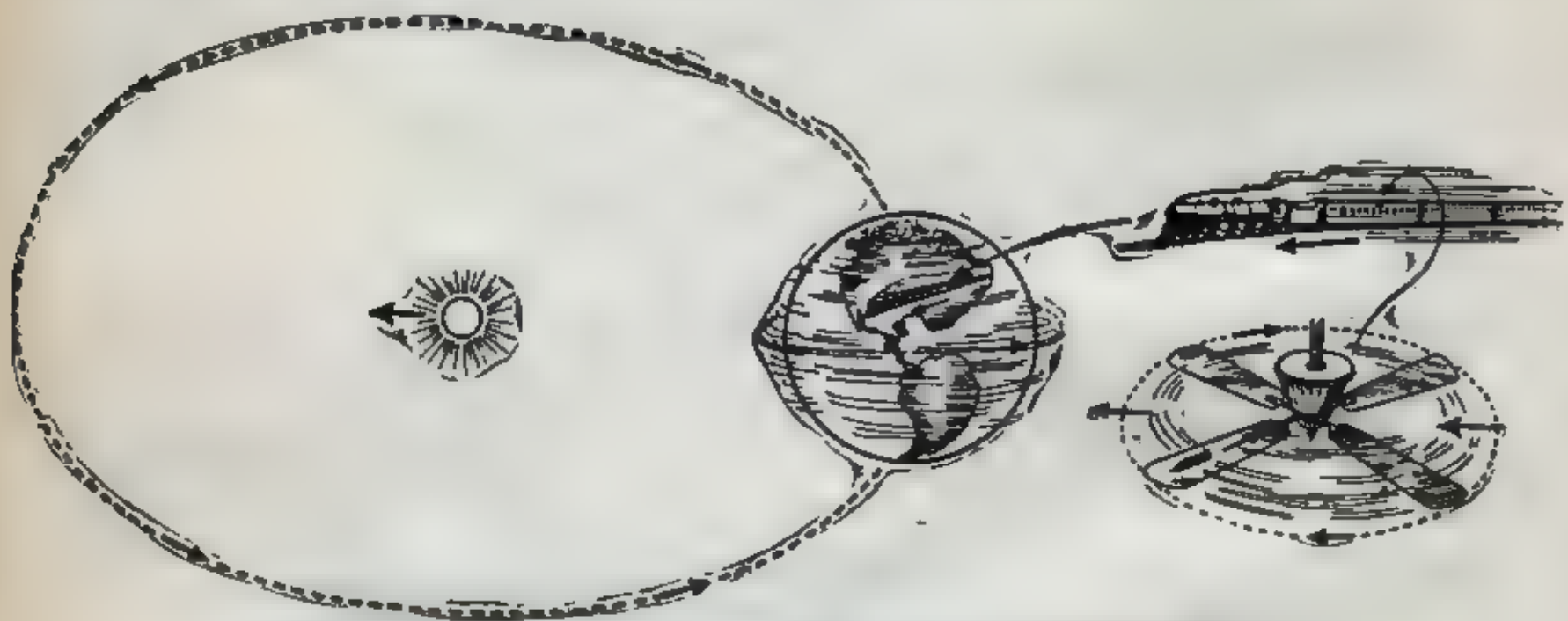
"That is exactly the case with us. The blade of the fan is our earth-moon system, and so far as I am concerned the course of the train corresponds to the motion of the earth.

"If the caterpillar wanted to leave the fan to enjoy a bouquet placed on one of the tables, it would certainly have to take into account the motion of the fan; if it even wanted to leave the dining car, because things looked better in the green meadow, it would suddenly perceive and have to take into account that the train was rushing through the world.

"That is just the case with us. If we wanted to go to Mars, then we should have to take into account, beyond any doubt, the orbit of the earth, in order to get from it to the orbit of the neighboring planet.

"What did you say months ago? It is all a question of the relation in which one stands to things. How right you were, Uncle Sam! Here, too, it depends on the viewpoint from which one regards things. Everything is relative in the world, even the purely material things.

"Do you understand now that I do not know the absolute course of our *Geryon*, and that there is no such thing at all?"



This diagram illustrates the complexity of the motion of any terrestrial object. At the right the caterpillar on the electric fan blade wishes to crawl to the center. But while he is moving the fan is rotating, the train on which the fan is located is moving, the earth is rotating and moving in its orbit and the solar system is moving. But the caterpillar wishing to complete his journey may ignore all motions but his own.

How simple it all sounded? Sam already regretted his silly question and determined henceforth to present his theories more carefully. He could only with difficulty rid himself of his earthly ideas and views. It was hard for him to imagine that phenomena which are incontestable and taken for granted on earth, about which nobody thinks at all, were fundamentally altered here or even made nonsensical.

For a long time he stood at the windows, letting the pure noble world of stars act upon him, while his pensive thoughts were scattered like cosmic dust. Thus the time passed. No experience and no event could disturb the stillness of their cosmos, unless it came from the little group of earthly men. And this even, which surprised all of them without exception, was not long delayed.

From the supply room came violent calls and yells, quick steps sounded, and a sailor rushed excitedly into the control room.

"Mr. Korf," he panted. "There is a stowaway on board! He was hidden among the boxes in the supply room. The cook just found him. He refuses to answer our questions and only wants to speak with you."

Berger jumped up in amazement. "How was this possible? Have the entire crew mustered in the mess room. Woe to the guards that let this man sneak in!"

"Don't get excited, Berger!" said Korf. "First we will listen to the man himself. Of course, if there has been a gross neglect of duty, I shall impose a severe punishment. Bring in the stranger!"

Pushed along by powerful shoves, a man stumbled up the ladder. Korf at once recognized in him one of the reporters to whom he had shown the ship shortly before the start. He had been struck by the man's thick, dark full beard, entirely out of style, which grew over his whole face and now hung down to his breast in tangled strands.

Apparently the bold man had taken advantage of an unguarded moment to hide himself, in order to take the trip and be able to furnish his paper with accurate accounts of the journey. He seemed to be in bad shape. He was all used up and bleeding from many cuts, and he could scarcely stand up. Since no springy hammock had protected him during the ascent, he must have been injured by the pressure.

"Your adventure may cost you dearly, sir!" said Korf to the intruder. "Apparently you do not know that I have life and death power over all the occupants of my ship! How did you get into the *Geryon?*"

"I shall give you all the explanation you want, Mr. Korf, in private!" whispered the man, smoothing his disordered beard. The voice was familiar to Korf. This eastern Jewish German he had heard not very long ago. A suspicion passed through his mind.

"Mr. Berger," he ordered, "just take the crew for a while to the mess room."

When Korf was alone with Sam and the stranger, he switched on the light, walked coolly up to the reporter, and with a jerk pulled off his beard, which was false.

"Why did you do it, Mr. Suchinow?"

The green-spotted face of the Russian was unmoved.

"Your trip concerns Skoryna's rescue, Mr. Korf. You would have refused my request to be taken along. But I have to be with this expedition. What else could I do but use a trick? I purchased the card of one of the favored reporters; this unworthy being sold it to me for a not excessive sum. That is all."

Sam hardly trusted his eyes when he saw this man before him. "Have you forgotten our agreement?" he whispered to Suchinow in Roumanian. "You gave me your word that time in Budapest."

"Not to undertake anything against Korf," put in Suchinow, likewise in Roumanian. "I have kept my word and I am still keeping it!"

Korf walked thoughtfully up and down. What did this man want here? He could imprison him or kill him, not being accountable to any court on earth.

"But why did you have to be on this expedition? If you were impelled by scientific interest, then you certainly had a chance to traverse space in your own rocket."

"My contract with the Transcosmos Company did not permit me to go in the rocket. But you are right, it is less interest in spatial navigation itself that impelled me to this adventure than the special aim of this trip—the rescue of Skoryna."

"For which your personal presence was totally unnecessary, Mr. Suchinow. I am inclined to treat you as a prisoner."

"I know that my life is in your hands. Do as you see fit. In a short time you will understand what actually caused me to intrude into your ship. For the present, please excuse me further explanations. That is all I ask."

"Very well! For the time being I shall assign you a cabin which you will not leave without my special permission."

Suchinow bowed slightly. "Thank you, Mr. Korf."

Korf telephoned to Berger, who at once appeared.

"Your mind may be at ease, Mr. Berger. There is no fault to be found with either yourself or the crew. My own carelessness made it possible for this gentleman to sneak on board. He is a French reporter. Monsieur Valé is for the present my prisoner. Take him to the extra cabin and look out for him.

"And one more thing, Berger! Please understand that I will not allow Monsieur Valé to be annoyed by the crew in any way."

When Suchinow was gone, Sam gave vent to his dissatisfaction. "What a shameless fellow! Wasn't it enough that he should use Natalka to . . . . " he suddenly stopped and then went on quickly: "He certainly cannot complain of lack of courtesy on your part. Why were you so gentle with him, Gus?"

"Because there was no point to being otherwise. Here he is, and I cannot have him put ashore. I am also convinced that he has no hostile purpose. What could he do? Any move directed against myself or the ship would plunge him to destruction. And I really cannot think what reason he would

have to injure me. I guess that this unexpected addition to the number on board is connected with the mystery about which you have forbidden me to speak. So we shall simply wait calmly—there will be an answer to the question."

CHAPTER XVII

Free From Gravity

THE next few hours of the trip to the moon passed without any special events. Outside the space ship nothing was to be seen but the stars shining brightly on the black sky and the yellowish disk of the moon, still low on the equator and apparently getting no nearer.

At first it was surprising to Sam that the course of the ship was not actually directed at the moon. But his newly acquired astronomical knowledge made it possible for him to calculate with some difficulty how fast the moon was moving in its orbit.

"By the time we get where the moon will be when we get there, the moon will be there, too!" was the excellent result of his figuring.

Then he withdrew to the smoking room, the only place on shipboard where he could busy himself with his beloved pipe otherwise than platonically. He lay smoking away comfortably in one of the hammocks which were used here as in all of the rooms of the ship. Now for the first time he felt perfectly comfortable. The strict rule against smoking in the carrousel had kept him from feeling a really unmixed joy of living.

The attraction of the distant earth became less and less. The loss in speed became constantly less, and the activity of the rocket exhausts was decreased accordingly. The decreasing pressure was becoming noticeable.

All objects lost weight, apparently. Limbs became free and light, while there was no alteration in the muscular power which was attuned to terrestial conditions. The engineers playfully lifted in one hand the heavy steel cylinders in which the liquid oxygen was kept, the moving of which had hitherto required a windlass and block and tackle. A joyous existence commenced for the cook in the electric kitchen. He could now drop plates and cups as much as he pleased: they slowly floated down to the floor and were not broken.

Soon these phenomena increased to such an extent that Sam, desiring to finish his rest after smoking, had to pay for his leap from the hammock with a severe bruise. He had struck the cabin ceiling, three meters above the floor. And when he turned the water faucet to wash his hands, the fresh liquid indeed sprayed out into the basin as usual, but the drops rebounded, rose into the air, and spread out as a fine vapor all through the room, finally sinking slowly to the floor and moistening everything.

Korf had indeed prepared him for all these phenomena. Yet he could not restrain a slight start, when every heedless step developed into a tremendous jump upward.

"Gently, gently!" he commanded himself. "Don't exert too much force and don't be in a hurry! You will simply get bruised."

His medical interest was awakened by a peculiar pulling sensation in the region of the chest and stomach, by the unusually accelerated beating of the heart, and on the other hand by the striking insensibility to pressure and blows, for establishing which there was ample chance. He conscientiously investigated his body, connected up his observation with the balance-organ of the human system, the chalk bodies floating in the semi-circular canals in the inner ear, made further investigations, and sought for teleological explanations. Sharply and logically he drew his conclusions. He was struck by the clarity of his thoughts and the speed with which his brain worked.

But these bodily phenomena soon leasened. There remained only a certain freedom from all feeling of discomfort, which expressed itself in his splendidly happy and unconcerned frame of mind.

The ladder to the carrousel he took in a single bound without any effort. Going down was changed to a gentle downward glide, without touching the steps. Sam could not help thinking of a dream which he had had incessantly since his youth, which still reappeared at longer or shorter intervals. Mighty swimming strokes with his arms and legs used to lift him in these happy dreams over trees and houses, and he gently floated down, by making the right motions. This dream had now become reality, something he had never thought possible, but with a difference: his "flight" was here interrupted by the ceiling, which opposed premature and painful limits to it.

The crew now went about in the ship almost exclusively by floating, and frequent cries of pain from the ceiling showed that it is hard for a person not to use the strength given him by nature. Sam could not keep back his laughter. The orderly grinned, the cook, the crew, and everybody showed the most delighted faces. Even Berger seemed to have got over his anger on account of the stowaway.

"To-day I have become twenty years younger, Gus!" cried Sam, as he floated like a ghost into the little casino which was connected with Korf's cabin and served as the officers' mess room.

"Stop right there!" replied Korf with a laugh. "We are not equipped to care for infants."

"It is simply great to travel around the universe this way!"

"Yes, one is tempted to turn somersaults and to slide down banisters like children," remarked Korf, pushing away from the ceiling, which he had approached by a careless move.

"One can rightly sing: 'We led a life free from care!' Free even from gravity!"

Sam Learns the Mysteries of Space

AT dinner there were mad scenes. The soup swam around in the air in tiny drops, until they learned to carry the spoon slowly to the mouth. A slight push on the table leg raised the entire table into the air. The general rising after the meal produced a wild confusion of chairs and persons whirling around in the room. In among things Berger's little parrot was fluttering around the lamp, screeching anxiously, and carrying his cage along on his

wings. After that the cage had to be tied down, to prevent mishap.

"Just tell me, Gus," cried Sam through the uproar, "how much do I really weigh now?"

Korf tried to suppress his own limitless amusement, which was hard to suit to the dignity of the commander of a ship.

"We now have from nine to ten centimeters acceleration pressure, that is to say, one one-hundredth of the normal gravity on earth. What weighs one hundred pounds on earth is here reduced to one pound. We couldn't get more than a pound and a quarter out of you, Uncle Sam!" He looked at his watch. "It is time for us to go above. I am expecting the sun soon, and we do not want to miss this spectacle!"

Then he turned to Berger: "Have you extinguished the outside lights?"

"Yes indeed, Mr. Korf!"

"Perhaps there will be a little fright on earth, when the *Geryon* suddenly disappears. But we must be a bit economical with our supplies of energy. Besides, the sun will soon make us visible again."

In the carrousel the electric light was extinguished except for a small lamp over the switchboard. Korf did not turn on the other lights, since he did not want to interfere with the observations outside. On the windows was the silvery glow of the moonlight, softening the darkness. The location of the earth was only to be distinguished by the dark starless spot, which spread out almost directly below like a hole in the starry canopy.

Korf and Sam sat on chairs screwed to the floor, holding firmly to the arms. On account of the lack of weight, it would have been otherwise impossible to remain standing quietly at the windows. The slightest movement would have started them floating off.

"Gus," said Sam, breaking the stillness, "there is something else that is not clear to me."

"I am not surprised. A great many events are puzzling to me, too."

"I mean the decrease in weight. If I, as you say, weigh only a pound now, that is no reason for me to float about in the room like an angel. A pound is, after all, a weight that is in the habit of falling to the floor very rapidly."

"That is where you are bringing up a subject which is hard to explain. You must first know that weight is nothing but hindered motion. You know that the earth attracts all bodies. A stone lying on the ground cannot follow this attraction; it presses on what is under it. It has weight which exactly corresponds in value to the acceleration which it would experience if it were not supported. On the surface of the earth this acceleration is the same for all bodies. A stone dropped from a church tower sinks five meters in the first second, fifteen in the second, twenty-five in the third, and so forth—ten meters more every second. To be more exact, nine and eight-tenths meters. From your school days you doubtless recall this figure nine and eight-tenths, which is called the normal acceleration on earth.

"In the first three seconds the stone accordingly falls forty-five meters in all. If the objects in our ship possess only one one-hundredth of their normal weight, in three seconds they fall only the same number of centimeters. But that is no longer falling, simply gentle gliding down."

"I understand perfectly. And does this decrease in weight come from the greatly weakened attraction of the earth so far off?"

"This is a plausible supposition, but it is not correct. The slight remnant of weight we owe entirely to the activity of the exhaust pipes, which to be sure are directed in the same way as the diminished gravity."

Sam started. "Do you mean that our weight depends merely on your gas lever, and that we will be weightless as soon as you feel inclined to set the lever at zero?"

"That is just what I mean!" agreed Korf calmly.

"But see here! Just consider that you cannot shut off the attraction of the earth at will! Or can you?" cried Sam desperately.

"Of course I cannot!" said the engineer, much amused. "The attraction of the earth is effective, even though it is weak at this distance."

"Now I am eager to see how you will make sense out of this confusion," remarked Sam, shaking his head.

"Listen! If I shut off the gas lever, then the ship and all that is in it yields to the attraction of the earth. It becomes like a freely falling stone, which is not supported and therefore is weightless."

"A fine prospect! Then we would fall back again to Lake Constance!"

"We are saved from that by the high speed which we so painfully secured. We would then describe a gravitational curve—the infinitely prolonged line of a parabola or rather a hyperbola. We would certainly make a free fall, not downward with increasing speed but upward with decreasing speed!"

"Fall upward?" stammered the physician. "Listen, Gus! For Heaven's sake, stop! I am getting dizzy. These 'explanations' will drive me crazy!"

He held his arms out in a defensive gesture; he had had enough of it. Korf pressed the excited doctor back on his chair and said soothingly:

"Permit me just one more remark, Uncle Sam. Keep this firmly in mind: we are always weightless when nothing influences the *Geryon* in its natural motion, neither mechanical power from within nor air resistance from without, no matter how near we may be to the earth or to any other heavenly body. . . ."

A cry of amazement cut short Korf's conclusion.

"Gus, see this arc of fire down there! The earth!"

A Dawn In Space

DOWN in the depths there was flaming forth a monstrous fiery arc extending halfway around the circle. At the extreme right edge of the earth's disk the sunbeams were appearing, making radiant outshoots in the atmosphere, and flashed in sheaves of light against the dark interior of the earth, the edge of which arose circular and deep black from the sea of light of its *corona*. It looked as though the mighty black disk of the earth—at this distance apparently twelve times the size of the moon and comparing with it like a hen's egg with a pea—had begun to glow at the edge and was shooting out immense sheets of flame.

Insignificant and tiny, the sickle of the moon

Down in the depths there was flaming forth a monstrous fiery arc extending half-way around the circle. At the extreme edge of the earth's disc, the sun beams were appearing, making radiant outshoots to the atmosphere.

floated at one side of the vast arc of light of the brightening earth. In amazement the occupants of the ship watched the fabulous spectacle, from the impression of which the dullest soul could not have escaped.

Korf telephoned to the orderly: "I invite Mr. Valé to come to the carrousel."

Sam cast a look of understanding at his brother-in-law. It would have been cruel to have kept anyone from this sight, this impression never to be forgotten.

Suchinow soon appeared, bowed slightly, and sank like the rest into silent wonder.

The splendor of the earth's sickle increased. At the top of the arc the sheaves of light seemed to be uniting into so blindingly brilliant a point that it was painful to look at it—and slowly the sun appeared from behind the earth. It had become impossible to look at the dazzling light without colored glasses.

"Attention! It is daybreak for us!" Korf's call brought their attention back to the ship itself.

Daylight was in the room. From below the sunbeams came in and cast bright yellow spots of light on the circular ceiling. The mats which covered some of the windows were glowing like translucent curtains.

After a trip of eighteen hours in darkness and night, daylight had set in, to remain faithful to the *Geryon* on the rest of the journey. Bright warm sunshine flooded the lighted side of the ship, while the shady side continued in deep darkness. A sunny, ever cloudless day was shining through the windows on the side toward the sun, but the opposite windows were veiled in black night. Day was not like that on earth.

There was no blue sky spread out above the *Geryon*. The firmament, in which the stars were shining peacefully, was deep black. Even very close to the sun one could make out all the stars by merely covering the white hot disk with the thumb. If such a ship had been available to Copernicus, he would not have had to go to his grave without seeing the planet Mercury.

The objects struck directly by the sun's rays—the external frames of the windows, for example—shone with a supernatural phosphorescent glow, in sharp contrast with the black sky. They reflected the light into the interior of the ship. It had finally escaped the last effect of the earth, its shadow.

CHAPTER XVIII

Cold Space

UNCEASINGLY the lonely space ship pursued its course through space, every hour increasing by thousands of kilometers its distance from the earth. The shining crescent of this planet was growing fuller and fuller, showing in plastic form the spherical shape.

So far as there was no hindrance through clouds, it was possible to make out the forms of the continents on the illuminated portion. Their brownish contours were sharply contrasted with the darker oceans. In the regions north of the equator the dull brown of the continents faded into light greys, because of the winter snows in the northern hemisphere. The north pole itself was veiled in the darkness of the polar night.

For hours Sam sat at the eye piece of the great telescope, which was now pointed directly down. He was watching the continents slowly emerge from darkness at the inner side of the crescent of light, pass across the bright part, and then disappear again at the outer edge. The rotation of the earth could be observed as well as the motion of the setting moon can with some patience be followed from the earth. In the telescope, spaces as big as a metropolis appeared as barely perceptible points. Identifying localities was made easier by the shadows of the mighty mountain chains of the Cordilleras, the Alps, the Carpathians, and the Himalayas.

"How fine it would be," he once remarked, "if we only had a powerful telescope that could distinguish separate houses down there. Then we could see about things down in Friedrichshafen, control the course of airships, and thus be something like a deity. A little turn of the screw, and the eye jumps from Bucharest to New York!"

"Be patient a little while, Uncle Sam, and then you will have this giant telescope at your disposal," replied Korf, moving his arms about and shivering. "As soon as we can leave the *Geryon*, I shall build outside a combination of lenses that will be ten times stronger than the greatest telescopes on earth. There is no dim, light-consuming air to prevent using any enlargements we like. But don't you find it uncomfortably cold?"

In fact, the temperature in the ship had already sunk below the freezing point. The heat evolved during the passage through the atmosphere had long since been radiated into space, and the electric heating devices could no longer replace the constant losses.

"I have a very simple means of producing any desired temperature," continued Korf. "I only need to catch the heat of the sun. But . . ."

"What 'but' is there? It will not hurt the sun to give us a little of its surplus heat."

"Not the sun, of course, but Heyse and Vacarescu!"

"For Heaven's sake, Gus, have you lost your reason? What in the world do Heyse and Vacarescu gain from our freezing here?"

"Assurance that the *Geryon* still exists."

"I do not understand that."

"It is very simple, just the same. You surely noticed before the ascent that the outer wall and the wings of our ship are painted black on one side, while on the other they are brilliantly polished and mirror-like. At present the mirror side is turned to the sun and reflects not only the sun light, thus making us visible on earth, but unfortunately the sun's heat as well. If I now turn the ship so that the black half absorbs the sun's rays, the heat comes in. On the other hand, it is hindered from radiating into space by the shiny coat which will be on the shady side. This will make it warm in here, but on earth people will vainly look for the *Geryon* and will rack their brains over the question of where we have gone. The trifling amount of light reflected by the rough black side will hardly suffice to penetrate the atmosphere of the earth. Anyway,

we are already more than one hundred and fifty thousand kilometers distant."

"Well, it is a very bad situation!" grumbled Sam. "Couldn't we avoid disappointing them this way by increasing the artificial heating?"

"To reach an endurable room temperature, starting at two hundred and seventy degrees below zero, in a ship the size of ours, would require such an amount of heat that we could not possibly produce it with the artificial means at our disposal. We must give up the idea. There is nothing to do but hide for a while from the observers on earth."

"And how do you manage this turning?"

"Between the cabins and the tank rooms are three immense driving wheels. The axes of the driving wheels are at right angles to each other, as in a three-dimensional compass. If the wheel the axis of which coincides with the long axis of the ship is rotated clockwise, the ship turns counterclockwise, according to the law of action and reaction. In this manner the ship may be given any desired position in space by starting the proper driving wheel. Of course these wheels have to rotate very fast. If the ship is to make a complete turn in a minute, the wheel must make a number of revolutions as much greater as its mass is smaller than that of the whole ship."

Korf had the gyroscope motor started. A dull humming commenced, which came to a higher pitch and finally sounded very shrill. Slowly, almost imperceptibly, the sun and the earth moved laterally around the ship. After a few minutes the revolution was completed. The shrill whistling became a hum, and soon there was silence.

As before, the sunlight came through the windows from below, diagonally, but from the opposite side. If a person had not been informed of the change, he would scarcely have noticed anything.

Thus it was that mankind became anxious and terrified and considered Korf's space ship lost.

From hour to hour the activity of the exhausts was lessened, and the movements of the passengers of the *Geryon* became more and more problematical. Walking on the floor had ceased; somersaults in the air were the regular procedure; any movement like a shove resulted in quick motion sideways or up in the air. It was possible to remain on the floor only by extremely careful creeping and holding on to the hand-holds which were provided everywhere.

On the second day of the trip, weight had sunk to a thousandth part; accordingly the weight of a person was only about seventy grams. Sam was just sitting in the smoking room, when Berger floated in and joyfully invited him to take part in the first flight from the ship—a flight in the truest sense of the word. He felt a bit uncomfortable at the idea of leaving the protective covering of the ship and trusting himself to nothingness. But the enterprise had a great attraction for him, and his curiosity was greater than his anxiety. Besides, he had now become so used to weightlessness that unpleasant surprises in this respect were hardly to be feared.

In the central room the rubber suits were all prepared. Korf was already dressed, except that he still held his helmet in his hand and examined it carefully.

"The pressure is now so slight," he explained to his hesitating brother-in-law, "that we can stay with the ship out there with an acceleration of only a centimeter a second. That implies no danger."

The Space Pedestrians

THEN he gave a few more instructions and impressed on Sam and Berger, who was also to take part in this first flight, the necessity of returning to the ship at once, as soon as they felt the slightest difficulty in breathing. He explained the use of the telephone wire, which was coiled up and hung on the breast of the suit. One end of the wire ran to the inside of the helmet and was attached to a microphone there. The other end was to be connected with one of the numerous plugs which were placed all over the outside of the ship.

"Do not forget," were Korf's final words, "to plug in the wire first of all. Then we can speak to one another or communicate with the men on board, and in case of need we can pull ourselves back to the ship by means of the wires. Let's go!"

When Korf had convinced himself that the helmets fitted properly, he opened the inner door of the exit chamber and had Sam and Berger enter. Then he carefully closed the door and turned an air valve, through which the air escaped with a whistling sound. The rubber suits puffed out, so that the little chamber had scarcely room enough for the three expansive figures. A turn of Korf's hand, the outer door opened, and the three men slipped out into outer space.

Sam cautiously crept along the smooth steel wall and looked for a plug. He had scarcely made the connection, when he heard Korf's voice. It seemed to come from a great distance, though all three of the companions were within reach of one another.

"Uncle Sam," said the voice, "do you understand me? How is your breathing?"

"Perfect! How about Berger?"

"Berger is all right," the latter announced. Thus communication was established.

The three figures clasped hands and commenced their wandering around the ship, while the wires easily ran out from the coils. If they had not already been accustomed to weightlessness, the first heedless step would have carried them far from the ship. It was only with difficulty that they succeeded in remaining within reach of the ship.

"What is that?" cried Sam in amazement. "What has happened to our space ship?" In terror he pointed in the direction of the exhaust. The slight motion had been enough to disturb the equilibrium. He gently floated away from the ship and slowly hovered off into space.

"What is the matter?" asked Korf, who also could no longer hold on and was floating off with Berger.

"Well, see how our proud *Geryon* looks now!" continued Sam. In his eagerness he did not notice that he was moving away. "It is as short as a burned out cigar stub, and two of the wings are gone!"

Berger snickered. It sounded in the telephone like a cough. Korf also laughed.

"A burned up cigar stub? A splendid guess, Uncle Sam! The cigar actually did burn up during

the ascent. That is to say, we cast off the two burned out auxiliary rockets."

In a moment the wire had run out to its full length, stretched taut, and held the three men like captive balloons at a distance of thirty meters. The sunlit helmets and suits gleamed in the absolute darkness with an unearthly phosphorescence. Day and night had joined in a seemingly impossible union.

It was an indescribable pleasure to examine the earth with this simple telescope and to view the cities enlarged many thousand times. It was even possible to make out the chief buildings.

The ship looked like a gigantic winged egg, a strange gleaming monster, in its course through space. At the blunt end a brightly shining white trail of mist was coming out.

"How do we get back?" asked Sam, after he had satisfied himself as to the shortening of the *Geryon*.

"In the pocket of your pneumatic suit you will find a small repeating pistol," was the reply. "Shoot it, and the recoil will put you in motion. You could also pull yourself back by means of the wire."

Sam followed this advice, and in a short time he was back at the ship. Reassured by the success of the "steering shot", he began to circle about the *Geryon*. He had a feeling of boundless freedom and delight. He would have enjoyed shouting aloud, in spite of his fifty-odd years. It was splendid to see his covered limbs glitter in the sunlight against the deep black background of the starry sky.

His ideas of up and down were passing away. Only a slight pull in the direction of the exhaust reminded him that there was still a down. Still, but not for long! In a few hours they would reach the limit of gravity. Then the motors would be silent, and even this last reminder of terrestrial conditions would vanish.

"Uncle Sam!" sounded Korf's voice suddenly. "Look out for the exhausts! The wire does not reach to the stern of the ship, but it might break. You might burn your suit in the currents of gas, which would most seriously imperil your life!"

"I shall look out!" answered Sam, turning around. He started slightly at not seeing Korf. He had not thought of the fact that he had telephoned.

Returning into the ship went in the same manner as leaving it. When they had got into the chamber, Korf let air come into it from the ship by means of a valve in the inner door, until the pressure was normal. Then it was easy to open the inner door. After that the flyers could take off their suits and exchange experiences and observations without using the telephone.

"Wonderful!" said Sam. "It wasn't even cold out there!"

"The layer of air in the expanded suit is a good protection against the loss of heat," agreed Korf, "and if the suits hold the air long enough, there is not the least danger. Did you notice at all that our ship is travelling eighty kilometers every minute?"

"No!" answered Finkle, surprised. "I never had

the idea-that we were travelling at all and not at some ether health resort up in space."

"It is just another case of the old story of the caterpillar and the electric fan. So far as we are concerned, the *Geryon* is standing still, while the earth moves away and the moon comes nearer. This only holds good so long as the motion of the ship remains even and is not too much accelerated mechanically. You might just as well not think of it."

In separate groups the crew was now taken out and shown the simple tricks and manoeuvers. Likewise Suchinow, who was no longer confined, was given a suit. It was not long before all on board the ship were accustomed to spend most of their time out in space, and whoever was not prevented by his duties climbed around on the wings or sped around in outer space like birds in the air.

Now Korf set about to make the promised giant telescope. A shaded concave mirror a meter tall was fastened by long metal bands several hundred meters from the ship. The reflections of the mirror were caught by an eyepiece in the window of the control room, and the telescope was completed. By means of a cord the mirror could be moved in all directions from the eyepiece and could be directed at any desired points.

It was an indescribable pleasure to examine the earth with this simple telescope and to view the cities enlarged many thousand times. It was even possible to make out the chief buildings. Only the rotation of the earth carried the focussed points beyond the field of vision so rapidly that it took much practice to be able to follow the motion of the objects by means of the primitive cord.

The last remnant of gravity vanished, when on the third day after the start the rocket motors were entirely shut off. The *Geryon* had reached that region in space where the almost imperceptible attraction of the earth is equalized by that of the moon, now rather near. It now obeyed only the laws of gravitation, like any ordinary celestial body, and fell with increasing speed toward the moon, the disk of which now far surpassed the earth in apparent size.

There was absolutely no more of up and down.

Anything not fastened down in the ship floated freely in the cabins. The men swam in the air, paddling with their arms and legs, if there was no wall in reach, to which they could cling. The idea of going to bed was meaningless: it would actually have required a great exertion to remain in bed. They slept, floating in the middle of the room. Sam floated about, smoking his pipe. The parrot floated in its cage with folded wings.

Drinking became a test of skill. To empty a bottle there was only the possibility of sucking out the liquid, like little children, or of sending out the contents by rapid turning of it. The liquid then floated in the room in the form of a sphere, which had to be caught in the mouth and sucked in.

Chairs and tables were put aside and fastened down in a corner. The hammocks were rolled up, and the rope ladders were removed, since they could no longer be used. A person needed nothing for comfort but free empty space.

Only the limited operating time of the oxygen vaporizer in the diving helmet and the necessity of eating hindered permanent staying outside the ship. In this state of affairs it is not surprising that many did not even notice that the mighty moon, which in the meanwhile had become round, was rising higher and higher above the central line of the ship, until it hung laterally above the carrousel, stretching out in the sky in a threatening expanse.

CHAPTER XIX

The Rocket Sighted!

THE nearer the *Geryon* came to its goal, the more restless Suchinow became. The impenetrable mask which he always wore fell off, disclosing the careworn face of a nervous, tormented person. Incessantly he surveyed the surroundings of the moon and its masses of "land," which were spread out in the sky in the bright sunlight, constantly increasing in extent as they came nearer.

Waste lands and plateaus cut by wide gullies were alternated with sharp-edged craters and mountains with jagged cliffs, the dark shadows of which indicated enormous heights. No woods, no sea, and no river broke the monotony of the dreadful waste. From the north pole to the southern edge, as far as the sunlight reached, there was nothing but bare ground, looking dried up, and steep mountains. No lighter patches indicated snow or ice, and not the tiniest cloud prevented a complete view of the wrinkled and shrunken countenance of the airless old satellite.

For fourteen terrestrial days the sun shines uninterruptedly upon the bizarre mountains of the moon, blazing down on the land, and producing a temperature like that of boiling water. For fourteen days the dried up waste then sinks into night and incomprehensible cold. It is no wonder that one would vainly search this inhospitable companion of the earth for animal life, to say nothing of beings like men.

In the northwestern part of the disk there opened up the ring-shaped mountain of Copernicus, enclosing with several concentric lines of mountains a wide volcanic crater, the floor of which showed still more dark openings. The bare crests of this mighty mountain chain towered more than four thousand meters above the surface of the moon, casting jagged shadows on the masses of debris close by.

A dark spot within the wide crater caught Suchinow's eye. Was he mistaken, or was the spot really moving? Now it had reached the edge of the crater and was creeping away across the mountain chain. Was it really not a dot on the moon but a body floating in space between the moon and the *Geryon*?

Suchinow could not see clearly. The excitement of many months was concentrated in this moment.

"The rocket is in sight!" was the cry of the outside observer through the telephone.

"The rocket is in sight!" repeated the man posted in the upper room, loudly, so that it rang through the ship.

Suchinow clenched his teeth. "Be calm!" he murmured. "It is necessary now!"

In the telescope the long torpedo-shaped rocket, which had kept the world expectant for almost half a year, stood out sharply against the bright surface of the moon. Its course was toward the northwest, and in a short time the rocket would pass beyond

the disk of the moon and would disappear behind it after describing a narrow loop.

Korf went up to Suchinow. "We are close to the goal, sir!" he said. "Would you like to take part in the operations?"

"I ask permission to do so!" replied the Russian with feverish eyes. "In what way do you intend to reach the rocket?"

"First the speed of the *Geryon* must be increased to that of your rocket. This is already being attended to. The ship is being attracted by the moon and diverted in its path. Now it is describing the curve of a narrow Kepler gravitational parabola, with the moon at the focus, and is coming constantly closer to it. At the same time our speed is being constantly accelerated by the free fall."

"The distance of the rocket from the surface of the moon seems to be not quite eight hundred kilometers. Accordingly the distance from the centre of the moon may be assumed to be about two thousand five hundred kilometers. It is possible to let the *Geryon* gravitate around the moon in the same orbit?"

"Absolutely! But we have not as yet the necessary speed to catch up with the rocket. I regard it as surer to approach as close as possible to the moon, to attain the utmost possible speed."

"And then?"

"Then we shall pass close by the surface of the moon and draw away from it again, until we strike the path of the rocket behind the moon. But then we shall certainly have a higher speed than that of the rocket, which can be braked at the right moment by proper use of the exhausts. It will of course not be easy to approach the little rocket in the great *Geryon*, but in any case it is better to have too much speed than too little."

"Wouldn't it be simpler," put in the Russian, "to stop the *Geryon* in front of the moon by means of countershots, in order to wait for the rocket right there?"

"That might be so. But in this case we should have to wait until the rocket completed its course about the moon. Besides that, it would require the expenditure of an almost unattainable amount of energy, first to stop the *Geryon* entirely, then to hold it motionless in spite of the attraction of the moon, and then again to accelerate it in the path of the rocket, which we unfortunately cannot influence. And without absolute equality of speeds coupling on the rocket is simply out of the question."

Back to Gravity

KORF gave orders to call all the men on board and to make the *Geryon* all ready to manoeuver. He personally convinced himself that the rocket chambers, the gas chambers, and the gyroscopes were all ready, and then he returned to the carrousel. At this moment he was only the technician and commander to whom a dangerous and difficult problem had been given, the solution of which demanded all his thoughts. Thus he did not notice how Suchinow watched the manoeuvers, pale with excitement and in feverish tension.

"All right!" came through the speaking tube from the engine room.

"Take charge of the gyroscopes, Berger! Keep the main exhaust directed straight at the centre of the moon!"

The driving wheels began to sing, the ship slowly turned on its short axis, and the moon apparently sank down until it spread out directly below the carrousel. The *Geryon* was now rushing through space, with one wing forward.

Korf kept his eye on the scales which showed the position of the compasses.

"At present our course indicates five degrees to the east of the moon. But see, the direction is gradually changing more and more toward the moon."

The moon came nearer with uncanny speed. Each individual mountain top could already be made out with the naked eye, and the yellowish landscape reached out of sight in all directions below the *Geryon*, looking like a waste of clay and stone. Since the vertical axis of the ship was pointed straight at the moon, while the course was obliquely inclined, the masses of the moon seemed not only to rise from the depths but also to come up sideways. This produced the impression that the gigantic moon was rolling upon the *Geryon*. The nearer the ship came, the more strongly this rotary motion affected the observers, who had to look away at times, to avoid becoming dizzy at the sight of the approaching land.

The rocket could no longer be seen from the carrousel; it had already entered the shadow of the moon.

"If we are lucky," remarked Korf, without taking his eyes from the compass scales, "then we shall succeed in cutting the path of the rocket so that we shall catch up with it behind the moon.—Isn't that so?" He stopped speaking, cast a glance at the plan of the flight curves, and said to himself, "The prearranged course does not quite suit!"

The course ran close by the moon; it even brushed the solid ground.

"If the exhaust fails now, we shall plunge helplessly upon the moon!" he exclaimed. His hand grasped the gas lever.

The ship gave a leap. With a crash chairs and tables overturned to the floor. There was a crash of broken dishes in the kitchen.

Dr. Finkle, startled out of his nap, rushed into the control room.

"For Heaven's sake, what is wrong?"

Korf did not answer. He was testing the course of the ship.

"It is all right!" said he, drawing a breath of relief. "We shall pass the moon one hundred kilometers away! Since we have no atmosphere to go through, there is nothing more to fear at present."

He called into the speaking tube: "Have the ship examined, Berger, to see whether anything has happened."

Korf ran his hand through his hair. "We have won the first trick!" he remarked, while he slowly pushed the gas lever back to zero. "You got a good scare, Uncle Sam, didn't you?"

"Oh, not too much. But what happened? Why did everything fall to the floor all at once?"

"I had no time," replied the commander, "to give any warning to those on board. I hope nobody was seriously hurt."

"Probably there was some broken glass and a few black and blue places. How was it that weight

Five streams of fire shot into space with tremendous violence. They cast the ship upward, the plaything of cosmic forces. The surface of the moon sinks down. In this moment not a breath rises or falls, not a heart beats.

all at once came back and took us out of all the clouds without any gradual transition?"

"'Clouds' is good!" said Korf, laughing. "You must mean the smoke clouds in which you are accustomed to bathe. Anyway, it is all over, and this impulse of weight was only a fraction of our normal weight on earth. We simply got unaccustomed to it out in space and lost the use of our organs of locomotion."

"Won't you finally . . . ."

"Oh, yes!" put in Korf quickly. "Just see how close we are to the old moon! What is more natural than our getting to feel its influence?"

"But why so suddenly and intensely?"

"I let the auxiliary exhausts work for thirty seconds at half power, to correct our course. That is all. I seem to have made a slight error in my calculations beforehand."

"And now?"

"We are falling around the moon, close to it. Have your camera ready. You will be able to take home such landscapes as no traveller on earth has in his snapshot album."

Berger's entrance interrupted the conversation. "Two men are in their cabins, taken with space sickness," he reported. "Otherwise everything is all right, except for a few broken glasses."

"Presumably they both stood on their heads at the moment of impulse," said Sam, going to see about the invalids.

Korf turned to Berger. "Have everything tied on that is not riveted on, and warn the crew about more surprises. If possible, have everyone in the hammocks. It is very possible that we shall have to change course several times more."

Meanwhile the surface of the moon had turned further. It was awe-inspiring to see the mountains increase in size and roll by at an uncanny speed. New strips of land kept rising up and passing by at the side. Each chain of mountains seemed about to catch up with and overwhelm the one before. Only men completely free from dizziness could bear to keep watching the grandiose sight of the apparently moving masses.

Sam reappeared. "The sick men will be all right. As soon as their stomachs are empty, they can walk again. You must keep food out of reach! The men are eating too much and moving about too little."

A Narrow Escape

SUCHINOW stood motionless at the window and stared down. The green dots on his pale face stood out unpleasantly.

"Soon we shall have below us regions of the moon never yet seen by the eye of man!" he said. Then, after a while, he added, "Except Skoryna!"

Sam was lying on his stomach in the hammock, as he always did when observing the "world below". "Gus," he called out anxiously, "how high are we above this nutmeg-grater down there?"

Korf smiled at this peculiar but rather apt comparison. "Just a thousand kilometers, Uncle Sam! We shall descend to about one hundred kilometers and then go upward again. If the moon had an atmosphere, we might feel some heat during this speedy passage."

The rotation of the "nutmeg-grater" became slower and then became an even lateral advance. In the distance mountains appeared on the horizon, moved on, and disappeared in the other direction at the edge of the moon. It was a quickly changing panorama. Gradually the sunlight became weaker. Dense darkness had long been in the deep craters. Only the summits of the mountains now emerged brightly from the twilight. They were nearing the border-line between day and night.

"It is becoming evening down there!" said Korf. "For the region over which we are just flying, the long lunar day is drawing to a close."

He viewed the surface of the moon, then turned to the compasses, turned to the optical distance measurer, and again observed the speeding landscapes. There was evident anxiety on his face.

"What is the matter?" asked Sam.

"It is remarkable! We have passed the point where we should be nearest the moon and we now should be rising!"

"Well?"

"The distance from the moon is again lessening. It is unexplainable! Let us wait a moment!"

Slowly, to be sure, but perceptibly they were again nearing the moon. The mountain peaks, rising from the twilight and gleaming in the sunlight, flew past more quickly, a sure sign that they had come nearer.

Anxiously and hastily Korf examined the instruments. "I can't understand!" he murmured, and his glances wandered undecided between the scales and the great mass of the moon.

In fact merely looking out already aroused the sensation of falling. In the direction of the flight immense dark mountains were towering up on the horizon. The *Geryon* was flying toward them, one wing ahead, in its mad course. The increasing darkness added to the dreadful sight.

Then Suchinow sprang up. "Can my suspicion . . ." He did not finish the sentence.

A leap like a tiger—a grasp of the hand—and the gas lever went up to its full extent.

Full gas to all the exhausts!

Korf seized his arm, too late!

A frightful shock hurls everything down. The acceleration indicator raced up the scale, going far, far beyond the red line.

Five streams of fire shoot into space, with tremendous violence! They cast the ship upward, the plaything of cosmic forces! The surface of the moon sinks down. Suchinow lies on the floor, like a crushed worm!

In this moment not a breast rises and falls—not a heart beats.

Korf has clung to the switchboard, clinging to it with a superhuman exertion. Lights dance before his eyes, and a glowing millstone presses down on him, crushing his bones.

Between moving blue veils he sees the gas lever. He seizes it with his teeth and pulls it back. Then he sinks down, while the pressure falls.

The tops of the mountains rush past below, almost within reach. The twofold danger is over.

Glassy eyes seem to ask what returning consciousness does not yet understand: What happened?

Within the ship there was a devastated look. The tremendous recoil had hurled everything to the

floor and smashed such things as were not in some way fastened. The frightful pressure had lasted only two seconds, but that had been long enough to crack chairs and flatten fruit tins.

Panting, Korf slowly picked himself up.

"That was very close to death!" he uttered painfully. "I thank you, sir, for your quick action. In a few seconds more our ship would have been smashed against the moon."

Suchinow looked about in confusion. Several minutes passed before he could speak. "Yet I should have been a murderer, if you had not taken a hand! Pardon my folly! I never dreamed that the *Geryon* could develop seventy meters a second acceleration."

"It was necessary! Only this risk could have saved us. Of course, if the fearful pressure had lasted even ten seconds, none of us would ever have seen the earth again!"

The half-stunned crew again recovered and at once set out to investigate the devastation in the ship. The hull of the ship itself had had no injury. It was built to stand the most extreme pressure. Likewise the apparatus and instruments, being placed on springs, had remained undamaged. The damage to the furniture could be repaired after a fashion.

"I confess," said Korf, turning again to the Russian, "I am not quite certain about the cause of this deviation!"

"The *Geryon* did not deviate from its course. I am convinced that this second approach toward the surface of the moon has a reason outside the ship."

"In the moon itself, then?"

"Yes! An idea which often used to take up my mind was the question why the moon does not rotate but always presents the same side to the earth. Now my suspicion has been confirmed. The moon is not a sphere but an ellipsoid, flattened on the side toward the earth. It is a body somewhat like an egg, with the long axis always pointed toward the earth. The tips, accordingly, have never been directly recognized by any earthly astronomer. If you now assume that the *Geryon* first passed by the bright central belt in its course, afterward going by the shaded rear protuberance, which is unluckily also provided with very high mountains, then all the events of the last few minutes are absolutely explained."

"You may be right," said Korf thoughtfully. "Your hypothesis fits in all respects. This egg-shaped moon must necessarily always turn the heavier side, therefore the which is flattest toward the centre of attraction, the earth. Accordingly it appears circular to the observers on earth."

"I hope that we shall pass the side of the moon on the return trip at a corresponding distance; then we shall recognize its circumference and find my hypothesis directly confirmed," added Suchinow. Then he sank again into his usual silence.

CHAPTER XX

Uncertain Hours

IT had also become dark in the *Geryon*, and absolute night lay about the ship. The sun had vanished behind the moon. The earth, which (like the moon, under normal conditions) might have given some reflected light, was for the present hidden by the dark masses of the near-by satellite.

With increased speed the space ship sped through the shadow of the moon, away from its surface, which in the darkness could not be seen. The unwonted darkness, together with the after effects of the shock they had just undergone, made the occupants sleepy. And when the exhausts began to operate again weakly, to force the ship into the path of the rocket, the pressure also made itself very unpleasantly noticeable. Even though it did not reach the normal terrestrial gravity, the passengers of the *Geryon* had become unused to weight. Just as during the ascent, it seemed as though there were lead in all their limbs. A dull pressure in their heads enfeebled their thinking, and unconquerable weariness fell upon the crew.

Soon all were in a heavy sleep bordering on a stupor. Suchinow, Berger, and Korf struggled with all their might against this exhaustion. In any case they had to avoid letting the *Geryon* pass uncontrolled by the orbit of the rocket, which would delay the rescue of Skoryna for days.

The ship had now been so turned that it raced through space with the exhaust-end first. Consequently the currents of gas exercised a braking effect. It was accordingly a question of changing the parabolic course of the ship to a circle by slow decreasing of the speed.

Berger was just nodding, when Korf's words startled him; "The moon is seven hundred kilometers below us. The height above the land is increasing only very slowly. I hope that we can soon let it gravitate freely."

A fine yellowish light was falling into the carrousel. The earth was rising behind the moon and spreading out its gigantic crescent, four times as large as the crescent of the moon which is reflected on clear nights in the waves of Lake Constance.

After a while Korf depressed the gas lever. The space ship was now floating about eight hundred kilometers above the mountains of the moon and was increasing this distance only very gradually. Its course was considerably curved about the moon, indeed not yet circular; but a further lessening of speed would have decidedly increased the difficulty of catching up with the rocket.

"For finer corrections," remarked Korf to Suchinow, "we must wait until we see the rocket. For the moment there is nothing to do but let the *Geryon* gravitate freely in an ellipse which is not much different from the circular path of the rocket."

Since the ship was again completely given over to the free play of natural forces, the pressure sank and absolute weightlessness was restored. The awaking sleepers found themselves and their resting places floating again in their cabins.

Soon after that the first sunbeam came through the windows. Far below the edge of the moon was lighting up strongly, and the spectacle of the awaking earth was repeated on the moon. But the flares of a corona, which had encircled the rising crescent of the earth, were absent because of the lack of an atmosphere. There were now two brilliant crescents floating below the ship, the earth and the moon. For the moment the moon, being nearer, had the upperhand in its fantastic size.

The crew became quickly gay, now that the pres-

sure had disappeared and weariness had gone, like the oppression of a bad dream.

"The sun seems to have gone crazy!" was Sam's criticism, as he was sitting at coffee with Korf and Berger. More exactly, he was floating around the casino chasing the brown globes of liquid. "When we were first fortunate enough to see it, it was down below. When we were hurrying to the moon, to scrape by it, it shone into the carrousel splendidly. Now it is squinting in at the side again, in a shamefaced manner. I should not have thought the centre of our system capable of such leaps. And the worst of all is that Mother Earth, whom I always considered a steady reliable lady of mature years, has become infected with these extravagances. Not to mention the moon, for this old chap is going his own way and is even bold enough to approach our earth!"

"You seem to be in a good humor, Uncle Sam!" remarked Korf. "It is not so very long since a certain person sneaked off to his cabin, very depressed!"

Sam grinned. "I cannot stand that accursed weight any more. I am all for the freedom and independence of space!"

"But how will it be when we return home and Dr. Finkle again weighs his hundred and thirty pounds and his fifty-six years begin to assert themselves once more?"

"Keep still, Gus! I beg of you! It worries me when I think of it. But there are a few days more before that."

"Do you think so, Uncle Sam? We now are on a course which would take us to the earth in twenty hours. We could also have more acceleration, once we pass the neutral zone and use the attraction of the earth."

This outlook seemed to afford Uncle Sam only a moderate degree of pleasure.

"When we have the rocket," he remarked, "there will be no great hurry about returning. Couldn't we take a little excursion to Mars?"

"Has the earth become too small for your taste for wandering? Yet how you hesitated to come on this trip!"

"That is explained by the inertia of matter, Gus. When I am sitting, I sit tight and I am hard to get to rise. When I wander, I remain wandering until some compelling circumstance stops me. As a physicist and master of gravitation, you must perceive this!"

The Rocket Captured!

SUCHINOW was sitting at the lookout, searching for the rocket. By using proper braking and directional shots, it had been possible to keep the *Geryon* about nine hundred kilometers from the surface of the moon and to force it into an elliptical path which for a long distance was the same as the orbit of the rocket. Since the *Geryon* had now a considerably higher speed than the rocket, the latter would certainly be overtaken, sooner or later.

Suchinow gazed eagerly in the direction of flight and soon saw, at the side of the moon, the bright point he had sought. It seemed to be coming nearer. He at once informed Korf.

"We have been fortunate," he cried in a voice hoarse with emotion. "The rocket is gravitating parallel with us a slight distance away."

A fleeting flush of pleasure was on Korf's face, as he now adjusted the telescope in the upper lookout and now plainly recognized the shape of the shining torpedo.

"Very well," said he, "the difference in our speeds is no longer very great and can be equalized. How long is your machine?"

"Eight and a half meters!"

"Eight and a half meters," repeated Korf, "with a visual angle of sixteen seconds! That corresponds to a distance of . . . of somewhat over a hundred kilometers," he went on, after a brief calculation. "That is still too far!"

Nearer and nearer came the rocket. They could already recognize the slim cylindrical shape without using the telescope. Korf moved the gas lever. "We must put on the brakes a bit more, or else we shall shoot past it!"

Suchinow operated the measurer of distance, his hand trembling on the screw.

The distance of the torpedo lessened to just three kilometers. Then the drawing closer stopped. The courses were now exactly parallel, both the *Geryon* and the rocket gravitating freely about the moon in concentric orbits.

"We might of course come a bit closer," said Korf to Berger, "but it would be dangerous. We cannot stop the rocket, and the great *Geryon* cannot manoeuver quickly enough to be certain of avoiding a collision. Now get over there quickly, before the distance again increases."

A wave of excitement swept through the crew. The great moment had arrived, the moment which the world had awaited for months in anxious impatience.

Since the space ship, with exhausts cut off, was circling freely in space like any ordinary meteor, with no artificial influence to disturb the play of natural forces, the proximity of the moon was no hindrance to leaving the ship.

Kinetic energy and the attraction of the moon determined the motion of the *Geryon* and forced it into the curved gravitational path—the same forces as operated on the passengers and sought to move them in the same manner. As long as no artificial influence disturbed the dynamic equilibrium, no force drew the men who left the *Geryon* away from the ship, any more than the walking stick of a man falling from a high mountain has any inclination to leave its possessor during the fall. It remains at an unchanged distance from him, as long as the free fall lasts.

The rocket and the *Geryon* seemed to lie still side by side, just like two express trains running side by side at full speed. A passenger on one express can shake hands out of the window with a passenger on the other. He can bridge the gap between the two trains with a board and pass from one train to the other. Nothing but the current of air, the road bed rushing away behind, and the noise of the rolling wheels would remind him that the whole system is in motion. Relatively to the rocket, the *Geryon* was motionless, and relatively to the *Geryon*, the passengers leaving it would float motionless in space.

Korf remained on board as commander, to be able

to correct at once any deviations in course which might arise during the expedition.

"Who is to attend to the coupling-on of the rocket?" asked the Russian hastily.

"Berger and two men. But if you would like to take part, there is nothing to prevent it. Only you must not lose any time in preparing."

Half a minute later the four men were already slipping through the chamber into space. Instead of telephone wires they had coils wound with long thin wire, the ends of which were fastened to the ship. Besides that, each was provided with a pistol and sufficient blank cartridges to keep their course to the torpedo by means of shots and in case of need to return quickly like little living rockets.

Scarcely had they reached the side of the *Geryon* which faced the torpedo, when Suchinow slowly bent his knees, touched the steel wall with his fingers, and eyed the course like a sprinter about to start. With all his might he sped off, with Berger and the two sailors following immediately. Quickly the four figures, puffed out like balloons and shining in the sunbeams, became smaller and smaller and finally shrunk to shiny floating dots in the black sky.

After five minutes Korf saw through the telescope how they braked their flight with a few counter-shots, reached the rocket, and fastened the wires. The first connection, a loose one, was established. One of the four, apparently Suchinow, was constantly circling about the tip of the torpedo, as though trying to view the interior through the windows.

"I wonder whether he is still alive!" murmured Sam, who was watching beside Korf and keeping his eye on him with a care that showed his paternal affection and also a certain anxiety.

"Why ask a question just now, which has already, God knows, cost me enough sleepless nights?" replied Korf in an effort to overcome his impatience. "In a short time we shall know the truth."

The Rocket Opened

MEANWHILE the great cable-drum had been taken outside and screwed on to the ship. A sailor unwound the cable and fastened the end of the wires leading to the rocket. Drawn from the other end, it wriggled through space like a glittering snake. Breaking of the wires was not to be feared, since weightlessness prevented any resistance. The sailor at the drum only took care that the cable ran out easily and without kinks. Slowly the cable crawled over to the rocket and was there cast around the steel hull and tied fast. The flash of a light-signal, sent by a pocket mirror, showed the observers in the *Geryon* that the fish was caught. The cable was wound up, became taut, and floated the mass of the rocket along slowly.

It came into view, a narrow steel cylinder about three meters in diameter. In front it was pointed and provided with windows all around the end. In back it had four great fins which during the flight through the atmosphere had served as stabilizing surfaces.

Korf ordered Berger to take charge of the controls and went out with Sam. There it lay, the mysterious body which had been shot into infinity months before —now captured and confined—conquered! It was only a dark wart on the immense hull of the *Geryon*.

But what of Skoryna?

No one said the question aloud. The windows of the rocket had become frosted on the inside and were no longer transparent. Nothing moved in the lifeless steel shell. Within arm's length was the poor tortured person—whether alive or dead—for who could tell? At present he was still out of reach in his dungeon.

Korf examined the circular door, which was just large enough to admit a person headfirst.

"The door is indeed fastened from within," said Suchinow, who immediately on returning had connected up with the telephone system of the *Geryon*. "Still it should be easy to break open. But how? If the air within escapes, he will at once be killed, since he has no pneumatic covering. If he still is . . . ."

He did not complete the sentence. He again kept trying to look through the frosted windows.

"The simplest thing would be to take the whole rocket inside the *Geryon*," replied Korf, "but our entrance chamber is too small for that. There is nothing to do but fasten on an air container, to make the double doors necessary for entering. Be patient a little while longer!"

He immediately made the necessary arrangements. He had foreseen this difficulty and had taken along the proper equipment. An airtight metal pipe, just big enough to hold a man, having a pneumatic door at the end, was welded on to the rocket. This was done in such a way that the door of the rocket was inside the pipe. Then a mechanic crept in, carrying tools and an extra rubber suit. Behind him the outer door of the pipe was securely fastened. It was no easy task for the man, working in the narrow space, but weightlessness made it less difficult for him. Soon the inner door of the rocket lay open.

CHAPTER XXI
The Yogi

SCARCELY was the body of Skoryna, unrecognizable in the rubber suit, safely within the ship, when the order sounded through the telephone, "Everybody on board!"

It was high time to start the exhausts, in order to retain and make use of the present favorable course to the earth and to avoid being carried around the moon again. A slight downward pull showed that technical means were again at work, carrying the ship away in opposition to the gravity of the moon, toward the earth, homeward.

Skoryna had been carried to Suchinow's cabin and given over to the doctor's care. Korf was for the time being so occupied with his navigation that he had no time to think of the person rescued. At the equilibrium point between the moon and the earth, which he hoped to reach in a few hours, he intended to continue the work on the rocket. It was to be welded fast to the surface of the *Geryon*, to prevent breaking loose in landing.

As for the rescued one, was he really saved or was he dead? Had help come too late?

Sam appeared in the control room, pale, trembling in all his limbs, depressed, as though he had some dreadful news to report. An anxious suspicion seized Korf. "Is he dead, Uncle Sam?" he asked hesitatingly.

"His heart still beats," replied the old doctor shyly, "but it is a wonder that he still lives. It is the strangest

phenomenon which I ever saw in all my practice." He stopped speaking, as though seeking for words.

"He is still alive?" cried Korf, and a burden fell from his heart. "God be thanked that we did not come too late!"

"I should not like to say so definitely as yet! He is in a dreadful condition."

"Speak up, Uncle Sam!" insisted Korf. "How is he? Is he—has he lost his reason?"

"A kindly fate has saved him from the worst thing, madness. No, it is not that!"

After a short pause, during which Korf's eyes never left his face, he went on:

There were now two excellent crescents floating below the ship, the earth and the moon. The moon being nearer had the upper hand in its fantastic size.

"Can you imagine a person lying unconscious for three months, without taking any nourishment, and still living? Living? Being alive now?"

Korf passed his hand over his forehead. "Did you say three months, Uncle Sam?"

"The ship's log proves it. The last entry is on November 21st, a few days after he sent the call for help to the earth. Then his strength, not merely physical strength but rather the strength of will and hope, seems to have left him. It was well for him to sink into unconsciousness, to think no more, hope no more, have nothing more to fear. It was well for him, and I hope it saved him. It spared him the last result, despairing of help there in the frightful loneliness."

Korf seized the little notebook which contained Skoryna's hastily written daily notes—the log book which every ship's commander fills out with painful exactness, as long as he has the strength to hold a pencil in his fingers. If Skoryna had no longer fulfilled this important duty, there was no doubt that he had been unable to do so.

Sam prevented his reading the book at the moment. "Wait a little longer!" he said. "You can make an exact study of it later. First let me finish my report. Skoryna is reduced to skin and bones, the image of a corpse. Yet he breathes, weakly but perceptibly. His body is not in any way injured. Meat broth carefully given will perhaps bring him back again to life and consciousness. I also have a valuable ally in the absence of weight."

"Do your best, Uncle Sam. You must succeed in saving the life of this pioneer of spatial travel."

"Nothing shall be overlooked," murmured Sam anxiously, as though he still had something on his mind. To gain time, he then said, "Have you ever heard that a human body could endure that? Three months without food! In India there are actually said to be fanatical Buddhists who let themselves be buried alive, to rise again years later as famous yogis. I always thought that fabulous. I travelled long enough in Bombay and on the Ganges, but I never saw a yogi who did not prove, on closer view, to be a clever trickster. But haven't we found a real yogi in Skoryna? I have tested it with the most varied theories. The weightlessness of gravitating bodies, the extreme cold in the rocket, the incontestable fact that with low temperatures albuminous cells have a prolonged life—perhaps all this

can and even must have led to a preserving of the body. But these are only superficial hypotheses, and the exact investigation of this riddle shall be the task of my later years."

"The main thing, to be sure, is that Skoryna is alive," remarked Korf. "Why and how are for the moment minor details!"

"For the moment, yes! But this question will allow me as a doctor just as little rest as the problem of the space ship has for many years in your own case."

"Can I see Skoryna?" asked Korf suddenly.

Sam appeared startled. In evident embarrassment he tried to evade the question. "Wait until Skoryna is stronger. You might be terrified at the deathly face, which hardly suggests a beating heart."

Korf was struck by this almost unmotivated pretext. "I am not so easily terrified, Uncle Sam!" He did not hide his amazement. Finkle turned to another subject. His embarrassment was actually surprisingly evident.

"What do you think about Suchinow? Have you really considered why he sneaked into your ship and in this way compelled his participation in the rescue trip?"

"Why this discussion? It is natural enough for him to have the greatest possible interest in the salvage of his hapless machine."

"Not merely the machine but rather the passenger!"

"Well? Isn't that a human feeling?"

"I believe I see through the riddle. Suchinow is —Skoryna's father."

Korf looked up in surprise. "To be sure! But why has he kept so still about it? He had no reason to conceal that he is the father of a clever and admirably bold young man."

"Well, so far as I know, Suchinow has no son."

An angry flush mounted to Korf's face. "What do you mean by this confused introduction?" he cried to his brother-in-law, who, it was evident, was keeping something back.

Sam bent his head and wiped the sweat from his brow.

"One more question, Gus! What do you think about Natalka?"

Korf straightened up and his eyes flashed threateningly. "You know more than you say! My word binds my lips. I have, for the sake of Skoryna, promised to keep silent about Natalka. But you truly make it hard for me to keep my promise. Speak or be silent! One of the two! But stop giving these confused hints!"

"Gus, you gave me your word, and you have kept it. You have never since then spoken about Natalka. But did you also promise never to speak with Natalka?"

"What do you mean?" cried Korf, staring at Sam as though at a ghost.

"You will, I hope, soon be able to speak with Natalka. She is in the cabin of Suchinow, her father."

Korf fell back as though thunderstruck. "I guessed," he groaned, after an anxious pause, "that Natalka was connected with Suchinow. But it never came to my mind that it was she for whom I was making my rescue expedition."

"I have been sure of it only for half an hour!" replied Sam timidly.

"Go! Go! Leave me alone!" exclaimed Korf roughly. Finkle withdrew, his mission finished.

Skoryna's Diary

FOR a long time Korf sat motionless, his head in his hands and his arms resting on his knees. The scales fell from his eyes; the foundations of the world seemed to totter. All was now clear. She had come to him as a spy, to listen to his ideas, to copy his invention, to steal his intellectual possession in a common tricky way! And this woman had been dear to him; he had loved this woman with all his heart and had trusted this sneaking traitoress unsuspectingly with his secret. A sob escaped him.

Probably—no, certainly—she herself had set fire to his laboratory, to conceal the traces of her theft. And the attempted rescue, the burned hair and clothes, had been a mere comedy, the trick of an actress, to lull the simple German to sleep! And then she went to Berlin. Yes, it all agreed wonderfully! This Mertens with the drugstore was put forward to keep him from following her; the supply of letters had been written to keep him quiet!

And what of himself? He had believed everything, taking everything for genuine, until Sam at Mother Barbara's had instilled the first doubt. A dreadful anger seized him, anger at the woman whom he had loved. He felt anger at Sam, who had knowledge of this network of deceit and had hidden the truth from him until this hour; anger at himself, for letting himself be fooled; anger even at his ship, which had been built with the money of this scoundrel on whose errand Natalka had deceived him. And Suchinow?

This green-spotted scamp had even been so bold as to sneak aboard the *Geryon*, to use this construction also at the earliest opportunity and to pass it off as his own work. The stupid German neither hears nor sees anything, and one may take all sorts of liberties with him.

A hoarse laugh came from his throat, sounding as shrill as the note of a cracked bell.

"You shall yet find out what I am, the whole crowd of you!" muttered Korf between his teeth. The characteristic Teutonic rage blazed from his wide open eyes.

He hoarsely called for Berger and gave him the charge of the ship until further notice. Then he locked himself up in his cabin.

The examination of Skoryna's log book distracted his gloomy thoughts. His eye at first passed mechanically over the firmly written lines, which he still had in mind from the letters. Then technical interest awoke in him, and with increasing attention he went over the clear account of the mad flight. The cosmic and technical phenomena were judged with admirable accuracy, and the appended tables giving the readings of the measuring devices provided valuable scientific material.

The notes began on the eighth of September, the day after the start.

. . . . "I do not know what is the matter with me. My forehead is all sweat, and my hair sticks to my face. Where am I?" . . .

. . . . "I must have been unconscious. I lost my senses in the frightful heat.". . . .

Korf found his suspicion confirmed. During the rapid ascent through the atmosphere the rocket had been overheated. If in the *Geryon*, starting relatively slowly and provided with good cooling apparatus, the heat of friction had been oppressive, how must it have seemed in the tiny rocket as it sped along! There was also an explanation of the failure of the lighting system:

. . . . "At last I have found the disturbance in the electrical system. The lead plates of the storage batteries bent because of the high temperature during the ascent, causing a short-circuit." . . . .

Then followed descriptions of the earth rising in the sunlight, observations regarding the diminishing gravity, and determinations of position by taking the height of the stars.

. . . . "I can no longer be mistaken in seeing that the speed calculated has not been attained. Perhaps the machine would have had a higher degree of efficiency by using several exhausts instead of one." . . . .

Korf felt confused. Had Suchinow then failed to use this simple and decidedly best construction of the powder-rocket? In excitement he read further.

. . . . "I cannot pass the limit of the earth's gravity without using considerably more acceleration shots than were calculated. Can I venture to use up the reserves to such an extent?" . . . .

. . . . "The thermometers indicate eight degrees below zero; at this temperature there seems to be an equilibrium between the access of heat from the sun and the radiation into space." . . . .

. . . . "I have now circled about the moon just eight hundred kilometers from the surface. My course is a closed ellipse. Without using tremendous amounts of energy I cannot reach the limit of gravity. What shall I do now?" . . . .

. . . . "For the third time I am going around the moon. My father was right; the moon is not a sphere but a pear-shaped body. —The solitude is intolerable, and the absolute silence rings in my ears like the roar of the Danube. —I cannot make up my mind to return to the earth; the remnant of energy cartridges would not be enough to hinder the free fall, and death would be certain." . . . .

What dreadful torments Skoryna must have undergone! The only alternatives were to seek a quick death by plunging through space to the earth or gradually to fall a victim to madness, there in solitude!

. . . . "Has anyone on earth seen my light-signals? Great Heavens, what if no one is able to bring me aid! Who is there to rescue me? My father? In a second rocket he will meet the same fate that has come to me. The amount of fuel which may be carried is slight. The only person for whom I hope is Korf. But how long will it be before he constructs his new invention? If I were certain that Korf is coming, if only a single word could reach me from the earth, then it would be easy to wait. But doubt, this fearful doubt of the possibility of my rescue from my prison is crushing me!" . . . .

The following notes became more and more scanty, and the illegible handwriting suggested a weakening of strength.

. . . . Shall I not rather bring about the sure end? Better a horrible end than an endless horror! Is my mind becoming a blank page?" . . . .

. . . . "I am getting tired. I talk with myself, to hear a human voice, and then the sound of my voice terrifies me." . . . .

. . . . "God in Heaven—if there is a God—protect me from madness!" . . . .

An absolutely illegible scrawl followed as the last entry. Doubtless the pencil had then slipped from the limp fingers.

Korf was utterly confused, as he laid the log book aside. The most contradictory feelings were surging within him. This woman had been terribly tried. The most refined torturer of the middle ages could not have devised these torments which Natalka had had to endure, in absolute solitude, in empty space.

He could not refuse her his pity and his respect. Still, she had betrayed him and lied to him. She had abused his confidence and trampled his heart under foot! In his mind there yawned a deep gulf, which seemed to him not to be bridged and which pained him infinitely.

Sam knocked. "Gus!" he cried, when he found the door locked.

"I wish to be alone!" said Korf harshly.

"Natalka has awakened. Won't you see her? She is asking for you."

For a while there was silence in the cabin. Korf was passing through a terrible combat with himself. This struggle lasted for whole minutes. Then the door opened.

"All right, I'll come!" he cried hoarsely.

Then he silently followed his brother-in-law to the bedside of this woman, whom he loved with the constancy of a man of thirty, whom he hated with the anger of an honorable man who has been shamefully cheated, and whom he admired as a martyr.

CHAPTER XXII

Natalka

IN the corridor Suchinow sneaked past. Korf looked through the man as though through glass.

Natalka was alone in the cabin when Korf and Finkle entered. Pale as a ghost, she was floating upon the bed, just held fast a little by the slight weight. She scarcely breathed, and her eyes were closed. Her glistening short black hair contrasted strangely with the sunken white face. Now and again a faint flush, coming and going like a shadow, colored her cheeks and testified that life had returned.

Minutes passed. Without moving, Korf gazed at the sharp features in which he could only with difficulty recognize the sweet face of his assistant. How this poor creature must have suffered! Pity overcame his anger.

Then Natalka opened her eyes. The long silken lashes cast narrow shadows on the lower lids. The pale face seemed suddenly changed. The great brown eyes looked around the room searchingly and then rested on Korf. A tender smile beautified her

mouth, which had been pinched in as though in pain, and her lips opened.

"Korf!" she murmured. "He has come!"

The sound of these few words, the liberated happy smile, and the deep sigh of a breast taking a breath of relief touched Korf to the heart. How Natalka must have longed for him, who alone could bring her help! But again a bitter thought came to his mind and hardened his heart. Yes, she had indeed longed for him, the technician, the rescuer! But what of Korf the man, whom she had mistreated?

"You are saved, Miss Weisz!" he said coldly. He himself felt the flatness of his words.

"By you! How I thank you!"

This sounded so tender and true that Sam could not understand how Korf was able to reply coldly:

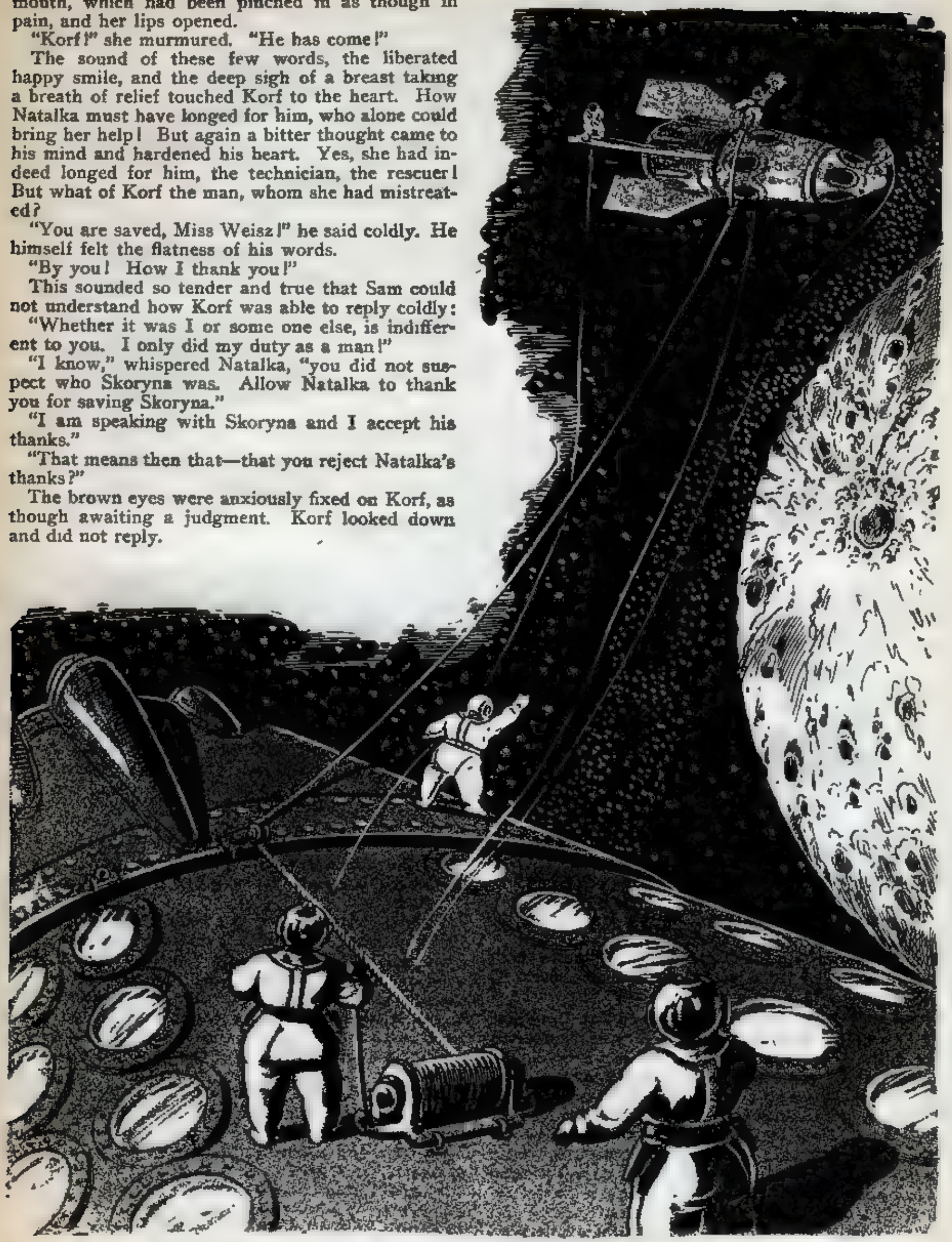
"Whether it was I or some one else, is indifferent to you. I only did my duty as a man!"

"I know," whispered Natalka, "you did not suspect who Skoryna was. Allow Natalka to thank you for saving Skoryna."

"I am speaking with Skoryna and I accept his thanks."

"That means then that—that you reject Natalka's thanks?"

The brown eyes were anxiously fixed on Korf, as though awaiting a judgment. Korf looked down and did not reply.



Slowly the cable crawled over to the rocket and was then cast around the steel hull and tied fast. Then the cable was wound up, became taut and floated the mass of the rocket along slowly.

With a groan the invalid fell back, while Sam bent over her, greatly worried. Then he whispered to his brother-in-law: "Any excitement is bad for her! Don't you see how you are torturing her?"

Korf gave the speaker an icy look. He was thinking of the day when Natalka visited him with Mertens—the day when he had felt the most terrible disappointment in all his life! Had Natalka asked then whether she was not perhaps torturing him?

"Then you cannot forgive me?" continued Natalka, and her question sounded like a plea. But Korf remained silent.

After a while Natalka straightened up. She seemed stronger, as she said in a clear voice:

"It is true. I am asking too much of you. But no criminal is judged without having a chance to justify himself. Will you hear me?"

When Korf nodded agreement, Natalka whispered with trembling lips, "August Korf, of what do you accuse me?"

Korf looked up in surprise. "Do you ask me that?" he answered in amazement, and yet it seemed to him that it would be hard to formulate an accusation.

"Yes, I ask you that, and you must answer!"

A strange uncertainty came over Korf. What was he to say? What did he really know? What had this woman done to him? The energy cartridge! Did he really have any proofs? And if so, had not Natalka just demonstrated at the hazard of her young life that this invention was worthless? After his victory by means of the detonating gas propulsion, what did he care about an invention that could no longer mean anything to anyone? It would now be ridiculous to make this affair the subject of an accusation. But what then? His thoughts were confused. His violent reproaches, which had been clear to him a few minutes before, had crumbled to dust at the simple question: "Of what do you accuse me?"

"You do not answer?" said the tired voice of the invalid. "Very well! Then I shall tell you your grievance against me." She remained silent a short time, to collect her strength for what she had to say.

"Did I not find out and steal your ideas? Is not the cartridge which operates my father's rocket your invention? Is it not your intellectual property?"

Korf made a gesture of indifference. "It is not worth mentioning. The powder rocket is played out."

"A sad end, indeed, for the shot into infinity! But what remains of my crime, if you cast aside with a wave of the hand my theft of your invention?"

Confused and embarrassed, Korf stood before the invalid. He had come as a judge, and now he was put to the question like a schoolboy who has not learned his lesson. What remained of his accusation?

Was he to cry out his pain at having his love disappointed? That would simply make him ridiculous!

Natalka smiled a little. "Listen, August Korf, I will confess to you. You shall learn everything."

Light from Natalka

OLD Sam had taken good notice of the change which was taking place in Korf. In excitement he waited further developments. Although he as a physician was insistent on keeping the patient from all harmful emotions, he said to himself that speaking things out clearly was far preferable to gnawing uncertainty.

In short sentences, broken by pauses of exhaustion, Natalka commenced:

"I do not conceal from you that I came to you on behalf of my father—to find out from you what we had long lacked to concinde our work of years—the necessary energy container of sufficient capacity to operate the rocket. I found more than I had dared hope. Your ideas intoxicated me. I recognized in you a genius far superior to my father's intellect. My most daring dream seemed near fulfillment by your invention. I forgot my father's pressing errand, I worked with you and for you on the complete solution of the problem to which my father had devoted his life and which was also the aim of my existence. I wished nothing further than the quickest possible completion of your—our—work, the building of a space ship, to conquer the universe—with you—through you!"

Korf saw the structure of his doubts tottering. He listened intently to the soft but clear words of Natalka. After a pause she went on:

"I should not have been a woman, if I had not felt that you saw something more in me than just a helper. And the hot blood of Hungary would not have flowed in my veins, if I had let this discovery pass without any impression on me!"

"Natalka!" cried Korf, trembling with emotion. But the invalid continued undisturbed.

"But ambition and eagerness for accomplishment overcame all other feelings in me. That is a spiritual inheritance from my poor restless father! You hesitated to use your work. You refused foreign capital, and in impoverished Germany you could not secure the necessary funds. Impatiently I longed for the building of a model which could be put to practical use. You seemed satisfied with the scientific solution. But I longed for the deed—the great liberating deed, to mark an epoch in universal history!

"And when I then saw that in your German thoroughness you were making no more progress and that no impulse, whether right or wrong, would set you in motion, to put the results of your genius before the world, I felt a boundless disappointment. You needed to steal, August Korf! To effect your end, stealing or any means at all should have been right to you, in order to bring to pass the wonderwork of the ages. It was a crime against mankind that national honor and trifling pride as a citizen meant more to you than this noble work. Nations rise and fall, ideas and opinions change in the course of time, but in the beginning comes the deed! It outlasts time, it creates epochs, it is the centre about which peoples and ideas are grouped.

"My father's letters reached me in this frame of mind. I had written him that you had solved the problem, and this brief message had caused him to act. He had found a financier, the Roumanian Romano Vacarescu. The construction of the Suchinow rocket had started. Then I made comparisons be-

tween him and you. There was my father, the man of iron energy, inspired with boundless ambition and an immeasurable will but with limited intellectual gifts! And there was yourself, the scientist, the genius! You had the means and did not know how to use them to the utmost end. In such moments I hated you! My father would have hesitated at no crime, if it had been necessary to realize his ideal. I, his daughter, have been a thief, to advance the cause which I served. I cared nothing for my father's personal glory and still less for yours! My life was dedicated to this work, and I think I have proved that this is not mere words.

"I have sacrified more than my honor as a citizen —I gave up happiness for the great work."

Korf was amazed to hear the revelations of a great soul, which he to be sure did not understand in all respects. Yet he began to have a feeling that in morality also there is perhaps a limit of gravity, at which the idea of up and down loses its meaning.

"After the unlucky burning of your laboratory I doubted whether your machine would ever be built. According to bourgeois ideas it was wrong for me to leave you at the time which was most difficult for you and your work. But what is right—what is wrong? They are ideas set up by human beings, who come and go! I saw you work, seek, weigh, and investigate—and the time set my soul on fire.

"I had collected your ideas, and in Berlin, at the home of my married sister, I carried them out painfully. My exhausts were differently constructed than yours—but that did not at all change my theft of your basic ideas and your powder-mixture in the energy cartridges. I placed my plans before my father and described them as stolen from you. I was forced to this half lie, since my father would have mistrusted my own constructions. Rightly, too, as the fate of our rocket has proved!

"Believe me, my acts were never directed against you, the man Korf. Under any circumstances—by means which you know—I had to keep you from seeking after me, which might have been dangerous to my father and consequently to the work."

For a time Natalka remained silent in exhaustion. Then she continued in a voice full of emotion:

"The goal is now reached. The space ship is speeding through the ether, and I am happy that it is after all Korf's work which has won the victory. And if my call for help from the moon helped to speed up your construction, then I gladly take upon myself the judgment of the world, and I am proud of my deed!"

Korf had long since lost his proud bearing. With lowered eyes he had listened to Natalka's confession. Her words rang in his ears, and he bent his head in shame—in shame because of the revealing of a soul which was stronger than his own.

"And if you really have done wrong," he cried, when she was silent, "those frightful weeks up there in horrible loneliness would outweigh a murder!"

There was a faint sorrowful smile on Natalka's lips.

"They mean nothing," she said softly, "compared with the anguish of my heart when I introduced my brother-in-law Mertens to you as—as my husband. That was my hardest sacrifice."

"Natalka!" stammered Korf, his heart almost too full for words, and he covered the hand of his loved one with kisses.

Old Sam felt that he was one too many, and he quietly withdrew. He was no longer worried about his patient, since joy is the doctor's best aid.

"The good fellow has a lot to learn yet!" he murmured to himself. "He is always flighty, one way or another!"

Then he looked for Suchinow, to tell him that his daughter was out of danger and to feel his pulse.

CHAPTER XXIII

Flight

THE *Geryon* had again reached the neutral gravity zone between the earth and the moon. The moon was becoming smaller and smaller, until it was again a yellowish disk floating in the black sky, while the earth increased in size proportionately. Since the space ship during its manoeuvers around the moon had been carried along a bit in the moon's orbit, it was now approaching the earth on the return trip more on the side toward the sun, and the crescent of the earth seemed fuller. More than half of its disk was already shining in the sunlight.

Berger, who had taken charge of the ship for the time being, was just considering whether it would be right to shut off the exhausts altogether at the limit of gravity and submit the *Geryon* to the attraction of the earth, or whether it would not be more sensible to get Korf's opinion first. Just then Sam came up to him.

"Why so grim a face, my dear Berger? We are homeward bound!"

"Grim, doctor?" said Berger with a laugh. "Not that I knew of! I was just reflecting whether I had better disturb Mr. Korf. I should like some directions as to what to do."

Sam touched Berger's arm. "Not now! Leave him alone, and act on your own judgment! I shall be responsible."

"Is it true, doctor," remarked Berger confidentially, "that Monsieur Valé is not a French reporter?"

"What do you mean?"

"I think he is the Russian rocket inventor, Suchinow."

"How do you know?"

"Well, I was thinking about his peculiar behavior. For a newspaper man he had a bit too much technical knowledge and interest in the doings of the ship. And then there was the way he talked about the rocket, which he knew perfectly well inside and out before we had even attached the cable to it. Then I said to myself that there was something queer about it. And the cook told that he had read in some Lindau newspaper, before we started, that the constructor of the famous rocket had been badly gassed during the war and in consequence had remarkable green spots on his face. So it was not hard to assume that . . . ."

"It certainly fits together, my dear Berger, and he actually is Suchinow. Anxiety about his rocket brought him on board our ship. And do you know who Skoryna is?"

"The conductor of the rocket?"

"Not a conductor but a conductress! Skoryna is not a man but a girl, the daughter of Suchinow!"

"Good Heavens! All honor to her!" cried Berger.

"What a girl! Really a girl like that might please even me, certainly far better than the ladies of Friedrichshafen, so crazy to be married, who just knit beautiful stockings, drink coffee, and wait for some one to come along and take them away! Bah!"

"Yes, we must take off our hats to her. Isn't that so, Berger?" Sam grinned to himself, well satisfied. It was important that Natalka should not be misjudged. "Do you remember the assistant who used to work with Korf?" he went on.

"Of course," said Berger, "she was a Miss Weisz, if I remember rightly. She had a clever head, this assistant, much better than many an engineer in the airport. I believe that Korf was very sorry when she went away."

"Now listen! Skoryna is none other than this Miss Weisz!"

Berger's mouth was wide open in amazement. "What! The assistant went to work on her own account and . . . ."

Sam put in with a laugh, "And this girl took in some of Korf's ideas and imitated him all of a sudden. What do you say now?"

As well as might be in the absence of weight, Berger slapped his thigh and cried:

"She is even better than Korf! Now I am not surprised that Korf was a bit fond of his assistant. They are worthy of each other!"

"That is what I think!" agreed Sam, well pleased. He was satisfied. Respect for Natalka's accomplishment seemed to prevent any distorted views. Of course he had to admit to himself that the opinion of Berger, an enthusiastic sailor of air and space, did not determine how the world at large would judge Natalka's acts.

"But what I wanted to ask, Berger, was whether you had seen Suchinow?"

"A quarter of an hour ago he got a rubber suit and went out to his rocket! He probably has various things to tinker with on it."

Since Sam had nothing better to do, he determined to leave the ship also for a little trip. He circled around the *Geryon* close to it and looked in at the windows. There he saw Natalka, smiling happily, hand in hand with Korf, who was eagerly speaking to her.

"I beg a thousand pardons!" said Sam, snickering to himself. "I will not intrude!" He turned quickly away and soon reached the bow of the ship.

"Well, what is the matter there?" he cried in astonishment, when he saw the rocket floating some distance away, unattached—freed from the ropes that held it. Suchinow was just creeping into his machine through the air container which had been attached.

"Stop! Where are you going?" cried Sam. In his eagerness he did not notice that no one could have heard his words. Persuaded by the absolute weightlessness, he had not put on a telephone wire and was therefore not connected with the ship's telephone.

Suchinow did not pay any attention to Sam but vanished into the rocket.

"What are you doing with the rocket?" he cried again, of course without any effect. With a mighty leap he sped from the ship toward the rocket. It was too late. A dense white cloud was suddenly formed in space, and the speeding torpedo was already vanishing in the distance.

Suchinow had fled.

The airless space, absolutely impervious to any sound, had made it possible for the rocket to leave at full power without anybody being able to hear the explosions.

Sam was in the dense cloud of fine ice crystals, formed by the discharges of the rocket. A white impenetrable mist surrounded him. The rocket had disappeared, and there was also nothing to be seen of the *Geryon*. Fine needles of ice clung to the leather covering of his pneumatic suit, besides sticking to the quartz lenses of the helmet. He had completely lost his sense of direction. In whatever way he looked, he could see nothing but the grey mist.

Lost In Space

"I CERTAINLY miscalculated to-day!" he said to himself, by way of reproof. He tried with a couple of pistol shots to escape from the mist, which no current of air was scattering. Unluckily he had taken the wrong direction, and when he had emerged from the clouds, he saw to his terror that the *Geryon* was floating in the far distance and was going farther and farther away. His own speed was constantly carrying Sam off in the direction he had taken.

He again pulled out the pistol and fired some braking shots. His quick motion, which had been comenced by the violent leap from the ship and increased by the first two directional shots, became slower and finally entirely stopped. But there was a long distance to travel back to the *Geryon*, glistening there in the distance, and the cartridge chamber of the pistol was empty.

In excitement he examined the pockets of his rubber suit for ammunition. In vain! There was not a single cartridge to be found. What should he do now?

He drew up his legs and sent them back quickly, as powerfully as he could, hoping that by such swimming motions he could commence to move along. But even if this would have had effect in the interior of the air-filled ship, in empty space his efforts had to remain ineffectual. However hard he tried, the distance to the *Geryon* remained the same.

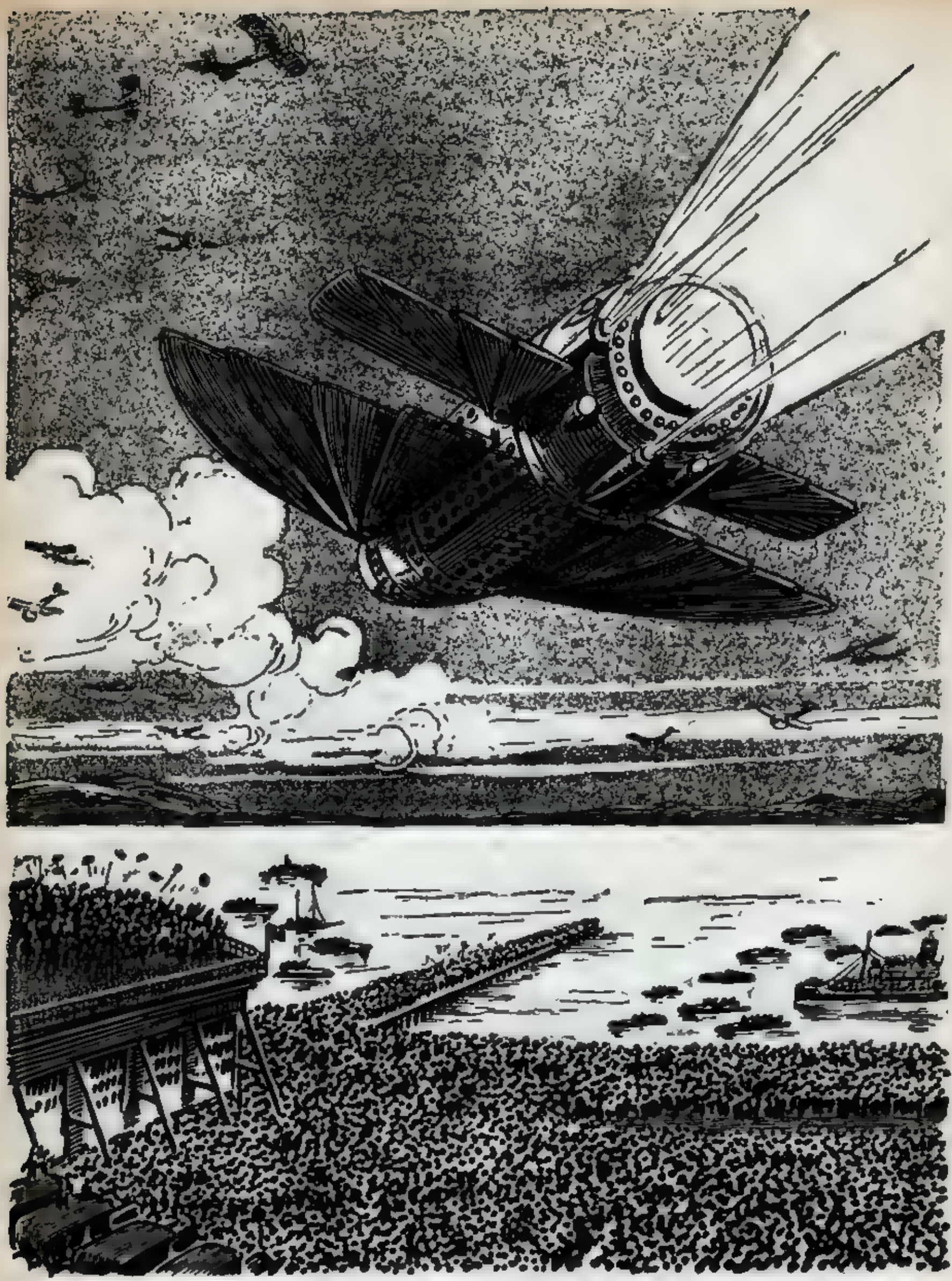
Tired and despairing, he ceased his fruitless exertions. A cold sweat ran down his back. He swore up and down that on future flights he would be fastened triply and would put on an armor of well-filled cartridge belts. All this, meanwhile, did not after the fact that the ship's doctor of the *Geryon* was going his way alone in space as an independent celestial body.

Then a gleaming dot came away from the ship. Sam drew a breath of relief. "God be thanked! My adventure has been observed!"

The dot increased in size and soon the inflated balloon-like figure of a member of the crew floated up to him. It took him by the arm and set the weary man in motion again by the recoil of a couple of pistol shots. It was Berger.

A few minutes later the two landed again on the *Geryon* and slipped through the chamber into the interior.

"Well, doctor!" said his savior with a laugh, when



Once more the *Gorgon flew* over the shed. Then it went out over the lake. Far out there it turned again to the shore and descended. The water splashed high as the wonderful bird settled down and cut through the foaming waves.

the suits had been taken off. "You want to be independent! Or are you also thinking of fleeing?"

"Has the Russian really gone?" replied Sam in excitement.

"For ever! The orderly just brought me this note, that was fastened to the lamp."

Sam hurriedly seized the paper. It was not sealed, and he therefore thought it proper to read the message, though it was directed to Korf.

"Receipt?" he muttered. "What can Suchinow give us a receipt for?" Then he read on:

"As representative and manager of the Transcosmos Stock Company, of Bucharest, having full authority, I hereby declare that I have received back from August Korf, of Friedrichshafen, the rocket R S I in perfect condition. In the name of the company I express to Mr. Korf my thanks and best wishes for this successful rescue expedition.

"Space ship *Geryon*, February 7.

Suchinow."

"A comical chap, isn't he?" said Berger, as Sam put the letter back in the envelope.

"That man has the devil after him. He cannot bear to return to earth towed by us. He prefers . . . ."

He left the sentence unfinished and went to Natalka's cabin.

"I must see about my patient a bit!" he said, when Korf opened the door to his hesitant knocks. "I must see that she is not excited and mistreated."

He was amazed at the brilliance of her eyes and the fresh color that shone on the thin cheeks of the invalid.

"I feel very well, doctor!" said Natalka. "I am going to be so happy on earth, with meadows and woods and animals and flowers. The flowers especially!"

"By the day after tomorrow, dearest," said Korf happily, "we shall be rocking on the waves of Lake Constance. That is to say, if it is not frozen. In our northern hemisphere it is now winter."

"Oh, then we shall go through the snowy pine woods, which glisten in the sun and cast blue shadows on the snow. We shall throw snowballs like children and coast down the valley. And in the evening we shall sit by the crackling stove and breathe the fragrance of roasting chestnuts and watch the apples smoke on the fire. And we shall hold hands. Can you understand, Korf, how infinitely beautiful all the little trifles of the earth seem—after the long weeks and months in space?"

"And the shot into infinity?" said Korf, jestingly.

"It has died away. My task is fulfilled. At last I may and will live!"

Sam thought it time to let the exhausted invalid sleep, and he pushed out his resisting brother-in-law.

"You have fifty years ahead of you, Gus! A few hours right now do not matter. Natalka is still weak and needs rest. Be sensible!"

In saying these words he did not suspect that the few hours did matter, after all.

Suchinow's flight surprised Korf but did not trouble him much. "All right!" he said indifferently. "As he appeared in the *Geryon*, thus he disappears again—unexpectedly and silently. I can sympathize with his wish to save the residue of his fame by making an independent landing."

"Do you think he will succeed in landing with his own power?"

"Why not? The *Geryon* brought him away from the moon, so that the rocket still has the supplies of energy provided for braking purposes. Let us not speak of it any more! Above all, do not mention the affair to Natalka at present! She might worry about her father's fate."

Joyfully the entire company looked forward to the landing manoeuvers. The speed of the ship, which had been greatly increased when at the moon, was now so accelerated by the attraction of the earth that already on the next day the brilliantly lighted earth extended in vast expanse below the carrousel. The continents were so sharply contrasted with the darker oceans that one might have thought he saw below him an excellently constructed terrestial globe.

The *Geryon* steered for the east edge of the earth, in order not to strike the atmosphere opposite to the rotation of the earth. This would have increased the relative speed and accordingly the danger from heat to a very high degree. Korf also wanted to land by daylight and therefore had to descend on the sunny side of the earth.

When the earth was so close that it no longer looked like a celestial body floating in space but rather like ordinary land, over which the *Geryon* was floating at an unimaginable height, Korf no longer left the control room. The most difficult part of the entire trip, the landing, was almost at hand. The radio of the ship was in action.

CHAPTER XXIV

On Earth

A TUMULT of joy seized the world when the first radio messages from the approaching *Geryon* were received by the great stations and sent all over the world.

Persons totally unacquainted embraced one another enthusiastically on the street. Banners waved from the houses. "Victory! Victory!" was the nation's cry of joy. The last crisis in parliament was forgotten. Party quarrels ceased, and pride shone in every eye, pride for the successful son of German soil.

The buildings of the great newspapers were at all times besieged by curious persons, waiting for the latest news, to spread it over the whole city in a flash. They did not seem to mind the cold, damp winter weather and the dirty slush in the streets.

There was a regular migration of the nations to Friedrichshafen. The little city swarmed once more with sightseers, who were unwilling to miss the sight of the landing of the ship from the sky. Mother Barbara did good business. Her café room was full to overflowing, and she was proud of her fellow citizens who had brought so many guests to her house.

"Yes, we Swabians," she used to say, "we are having a celebration for Korf!" And no one could deny it.

Korf's radiograms had set the landing for February eighth. Very early in the morning the landing place was alive with people. The farmers to whom the adjoining fields belonged were complaining of the crowds that heedlessly walked over the fields, but against the great numbers they could do

nothing. Temporary booths sprang up and refreshed the freezing mob with hot drinks. The bare wintry fields, covered with dirty grey snow, had in a few hours changed to a wild encampment, and the solid ground was being trodden into black sticky mud.

Luckily the fine rain of the past few days, which had been accompanied with snow, had ceased. Now and then a sunbeam even penetrated the moisture-laden clouds and caressed the swarm of people down at the landing place.

In the great semicircle on the shore around the space ship shed, guarded by soldiers, a band took its place. Film operators had set up high airy stands, from which they now and then took pictures of the ever moving masses. An army of reporters, pencil in hand, spent the day freezing.

Toward eleven o'clock appeared the automobiles of the government officials and the guests of honor. A whisper ran through the crowd at the appearance of Director Heyse's car, from which he watched the sky through a majestic telescope.

"We shall have a surprise, your excellency!" he said to the government minister sitting beside him. "The clouds cut off the view, and before we know it, the *Geryon* will break through and be here!"

"I am afraid that these dense clouds will cause trouble for Korf in locating where he is," said the grey-bearded man.

"Hardly!" replied Councillor Heyse. "The taking of bearings by radio is so dependable that the *Geryon* can know its position exactly without seeing the earth. Anyway, Berger is an expert in this. It was he who first used this method of determining direction and location on the flight of the *ZR-3* to America. Since then taking bearings by radio has been greatly improved. Also . . ."

A wild cheer from the crowd swallowed up Heyse's last words. To the southwest a dark spot had come through the clouds and was becoming visibly larger.

The *Geryon* was in sight!

It came nearer and lower in an oblique flight. The mighty wings shone brightly at times, when a sunbeam struck them. The egg-shaped hull could already be plainly recognized.

The cosmic speed had long been used up in the dense atmosphere, and the space ship was manoeuvering in the air like a gigantic flying machine. Then it swept low in a glide. The mighty mass soared close to the heads of the onlookers, so that many anxiously rushed away, and an incurable confusion took place. They could not escape the impression that in the next minute the uncanny structure up in the air would rush down and bury the people under its steel mass.

Once more the *Geryon* flew over the shed, just twenty meters in the air. Then it went out over the lake. Far out there it turned again to the shore and descended easily and surely. The water splashed high as the wonderful bird settled down on the lake and cut through the foaming waves.

The crowd began to move. They swelled down toward the shore, and the police cordon had to struggle hard to keep open the space between the shed and the landing bridge.

The little auxiliary exhausts rattled a few times more. The ship rushed on, became slower in its course, and then lay rocking by the pier, built far out into the lake. It was a lifeless steel shell, which no one could have thought the monster which a few seconds before had floated freely in the air.

Breathlessly they waited for the appearance of the commander. Heyse's car drove close to the pier, and the occupants got out. A few soldiers quickly ran a gangway to the entrance of the *Geryon*.

At last a man appeared in the dark opening. A deafening cheer came from ten thousand throats to the conqueror of space and drowned out the sounds of the band.

"Hurrah for Korf! Hurrah for the *Geryon*!"

The crowd went wild. The man on the gangway waved his hand in a tired fashion. It was Berger.

Oppressed and slowly, as though a vast weight rested on him, he walked to Heyse, straightened up with difficulty, and announced briefly: "The space ship *Geryon* safely landed!"

"Welcome to you brave men!" cried Heyse heartily, shaking Berger's hand. "But——," he hesitated a second, while an anxious question was in his eyes, "where is Korf?"

Berger was relieved of an answer. A silent procession came slowly over the pier. Dr. Finkle came first, bent and weighed down, like all the rest from on board the *Geryon*. Unused to the earth's gravity, they were bent under the weight of their own bodies and could stand upright only with a great effort.

Then followed the members of the crew, carrying a bier on their shoulders. Behind came Korf, his head bare, pale and distressed.

He did not see the people who had come on his day of glory from all parts of the country. He did not hear the incessant enthusiastic applause. He did not know that all eyes rested proudly on him, the hero they were celebrating this day, who had accomplished what seemed impossible.

Silently he followed the men who were carrying what was dearest to him. There was infinite sorrow in the dull look which he kept fixed on the motionless shrouded figure upon the bier.

"Germany, Germany above all else!" sounded from the band, and the crowd continued: "Above all else in the world!" The national anthem of Germany rang out over the bare fields and the crested waves.

Korf's lips moved as though in pain. "Above all else in the world!" he repeated feebly. Then he turned to Heyse.

"I congratulate the German nation for this success!"

That was all that he could say to the people who had awaited him in feverish excitement and were ready to heap him with honors.

The day which was to have been Korf's most sacred day of honor and happiness had become the bitterest of his life. The suddenly returning gravity had pressed the body of Natalka, weakened and unused to weight for many months, with extreme violence upon her bed. The earth itself, which had been the last desire of this much tried mortal, had accomplished what the cosmos had been unable to do. Her heart, which for half a year had defied the most awful death, had ceased to beat a few hours before the landing.

"Above all else in the world!" resounded the song

of the enthusiastic crowd. To Korf it sounded like mockery.

The Fate of Suchinow

WEEKS had passed.

A veritable flood of congratulations came to the victor of the *Geryon*. Countless interviews took place along with countless banquets of celebration. The ceremonial founding of the Korf Space Ship Company crowned the work by Lake Constance, as the final act of what was past and the initial impulse to new deeds.

All the newspapers on earth described the bold flight, showing the "lucky ship" in all sorts of pictures, and connected with it the wildest hopes for the future development of the epoch-making invention. In all civilized countries there was striving to be able to greet the men of the *Geryon* within their frontiers as guests. Korf's name resounded around the earth.

But Korf cared little about the uproar caused by his deed. In restless activity he sought to still the gnawing grief for Natalka. With fiery zeal he worked on the projects of the company. The possibility of travelling in space was now proved. Now it was a matter of using what had been done. He had to utilize the experience gained in the *Geryon* to build new and more efficient space ships and to take possession of the moon and the neighboring planets. His boldest hopes were approaching realization, but there was still a long way before him.

In vain they waited for the landing of Suchinow. The rocket remained unheard of. Certainly the observatories had watched it when the bright spot left the space ship. But that had been the last word from the rocket. The fate of the unlucky Russian remained a riddle. But weeks later light was cast by the news from an overdue whaler, coming back from the south coast of Greenland.

The crew of the ship had been surprised on the eighth of February by a singular phenomenon. Suddenly, though there had not been a breath of air, there was a hissing and roaring in the air, as though a cyclone were coming. Before the terrified crew came to their senses, a mighty waterspout rose to heaven not far from the ship, disappearing equally quickly. When they had passed by the spot, they had been struck by the warm air permeated with clouds of sulphurous smoke. This event was so odd and inexplicable that the captain took exact observations of the locality and put all the details of what he observed in a full report.

When Korf learned of this report, he said quietly, "Suchinow did not think of the atmosphere, which we entered from the side. Probably the torpedo burst open in the atmosphere on account of the one-sided pressure and plunged unguided into the sea."

Honor By Forgetting

SAM'S practice increased. He had a great rush of real and imaginary invalids, who stared at the ship's doctor of the *Geryon* as at a strange beast, until it got too much for him. He kept curious persons away by charging outrageous prices.

With all possible means he stirred the zeal of his brother-in-law to work. He carefully avoided any reference to Natalka, hoping that time would heal all the scars.

But one day, when he had just come to see Korf, to invite him to take a walking trip, a great yellow envelope was delivered, directed to Korf in person, bearing the return address of the Magyar Bank.

"What have you to do with this Hungarian bank?" asked Sam casually.

"I am accustomed to letters from persons I do not know," replied Korf indifferently, as he opened the letter. "I have had more mail in the last few weeks than I did in the ten years before!"

But scarcely had he looked at the papers within when his indifferent expression vanished and his heaving breast showed his emotion.

"What is it?" asked Sam eagerly.

Without saying a word, Korf went to his workroom and locked himself in.

Sam walked uneasily up and down. He feared new disturbances of his brother-in-law's mental balance, secured with so much trouble, though he could not imagine how a letter from a bank could trouble Korf in any way.

A half hour passed without Korf's reappearance.

Sam could no longer control his uneasiness, and he desired to be admitted to the engineer's room.

"Excuse me, Uncle Sam!" said the latter as he opened the door. "I totally forgot you were here."

He seemed calm, quiet, and even smiling sorrowfully. Without being asked he passed Sam the letter from the bank. This stated that now, after the death of the rocket-operator Skoryna had been established, the latter's disposition of the insurance money had been opened. The sum of twenty thousand English pounds had been willed to Mr. August Korf of Friedrichshafen. As soon as Mr. Korf furnished proof that Skoryna's death had not been natural but had been due to a mishap in the rocket.

"These people are causing themselves too much trouble!" said Korf impatiently, before Sam had finished reading. "Mr. Vacarescu may be at ease. I shall offer no proof, and he will not have to pay."

Then he folded up a letter which had been enclosed with the letter from the bank, placing it carefully in his breast pocket.

"The last words from someone now dead!" he replied to Sam's unspoken question. He sat down by the stove and stared silently into the flames.

"Gus!" Sam put his hand on the engineer's shoulder. "Leave the dead in peace! It was to be! And . . ." he hesitated a moment, "and it was best so!"

"Yes, it was best so!" he repeated, as Korf looked up questioningly. "Are you going to grieve for a person who died in the moment of greatest happiness? Look, Gus, you no longer belong to yourself or to her. You belong to mankind, and the world has a claim upon you. The man must be free and unchained by any ties, who is called upon to conquer the realm of planets. You will and must complete your task, for the sake of mankind and of Natalka. You are mistaking the will of this great woman, if you eat out your heart in mourning for her. Thank her by your deeds, and honor her by forgetting her!"

Korf raised his head. "You are right, Uncle Sam!" he said slowly. "To be alone and solitary is the lot of him to whom the vibrations of the universe are familiar and the currents of a great soul are unknown. I will forget Natalka for the second time, that her work may live on!"

THE END

The Artificial MAN

by Clare Winger Harris

Before David's startled gaze the newcomer placed his right hand to his left shoulder and removed the left arm. He then proceeded to dismember himself until only a torso, head and one arm remained.

IN the annals of surgery no case has ever left quite as horrible an impression upon the public as did that of George Gregory, a student of Austin College. Young Gregory was equally proficient in scholastic and athletic work, having been for two years captain of the football team, and for one year a marked success in intercollegiate debates. No student of the senior class of Austin or Decker will ever forget his masterful arguments as he upheld the affirmative in the question:—"Resolved that bodily perfection is a result of right thinking." Gregory gave every promise of being one of the masterful minds of the age; and if masterful in this instance means dominating, he was that—and more. Alas that his brilliant mentality was destined to degradation through the physical body—but that is my story.

It was the Thanksgiving game that proved the beginning of George's downfall. Warned by friends that he would be wise to desist from the more dangerous physical sports, he laughingly—though with unquestionable sincerity—referred to the context of his famous debate, declaring that a correct mental attitude toward life — he had this point down to a mathematical correctness —rendered physical disasters impossible. His sincerity in believing this was laudable, and so far his credence had stood him in good stead. No one who saw his well-proportioned six-foot figure making its way through the opponents' lines, could doubt that the science of thinking rightly was favorably exemplified in young Gregory.

CLARE WINGER HARRIS

IT is well established today that human beings can get along without a number of their usual organs. We have seen men deprived of their arms and legs who could still do useful work. There are men living, and seemingly little the worse for it, who have lost either an eye or a nose, or have only one kidney, and it is now possible even to have an artificial voice in case a part of the larynx and the vocal chords have to be removed through disease.

That science will discover more and more how to artificially replace human organs is a foregone conclusion. How far this process may go no one however knows. Recent experiments on animals have shown that it is even possible for a cat to live with an artificial rubber heart. These experiments are all of vast importance to humanity, because we may be deprived of a number of our organs by accident or disease.

The author of the present story has taken these thoughts as a basis of a most interesting narrative which is in its entirety based upon excellent science, and there is no telling that an exact counterpart of what she so vividly describes may not come about sooner or later.

But can thinking be an exact science? Before the close of that Thanksgiving game George was carried unconscious from the field, and in two days his right leg was amputated just below the hip.

During the days of his convalescence two bedside visitors brightened the weary hours spent upon the hospital cot. They were David Bell, a medical student, and Rosalind Nelson, the girl whom George had loved since his freshman year.

"I say, Rosalind," he ventured one day as she sat by his bedside. "It's too bad to think of you ever being tied up to a cripple. I'm willing to step aside—can't do it gracefully of course with only one leg—but I mean it, my dear girl. You don't want only part of a husband!"

Rosalind smiled affectionately. "George, don't think for a minute that it matters to me. You're still you, and I love you dear. Can't you believe that? The loss of a bodily member doesn't alter your identity."

"That's just what gets me," responded her lover with a puzzled frown. "I have always believed, and do now, that the mental and physical are so closely related as to be inseparable. I think it is Browning who says, 'We know not whether soul helps body more than body helps soul.' They develop together, and if either is injured the other is harmed. Losing part of my body has made me lose part of my soul. I'm not what I was. My mental attitude has changed as a result of this abominable catastrophe. I'm no longer so confident. I feel myself slipping and I—oh it is unbearable!"

Rosalind endeavored to the best of her ability to reassure the unfortunate man, but he sank into a despondent mood, and seeing that her efforts at cheering him were unavailing, she arose and left him.

In the outer hall she met Bell on his way to visit the sick man. He noticed her troubled mien and asked if George were not so well today.

"Yes, David," she replied, a quiver in her voice, "the wound is healing nicely, but he is so morose. He has a notion —oh how can I tell it— a sort of feeling that some of his mental poise and confidence have gone with his lost limb. You will soon be a graduate physician, won't you assure him that his fears are groundless?"

"I don't know but that his case is one for the minister or psychologist rather than the medical man," answered Bell. "His physical wound is healing, but it seems his mental wound is not. However, I will do my best, not only for your sake, Rosalind, but because I am interested in the happiness of my old college chum."

Rosalind smiled her gratitude and turned abruptly away to hide the tears that she had held back as long as possible.

Five months passed, and with the aid of a crutch George made excellent headway in overcoming the difficulties of locomotion. If David and Rosalind noticed a subtle change in the disposition and

character of their mutual friend, they made no further reference to it.

A Transformation

AT length came a day when in the company of both of these faithful friends George Gregory announced his intention of using an artificial limb instead of a crutch. His sweetheart voiced immediate remonstrance.

"No, George, I'd rather see you walking with the visible aid of a crutch than to think of your using an artificial leg. Somehow it seems like hypocrisy, a kind of appearing to be what you aren't. I know my idea is poorly expressed, but that's the way I feel about it."

A peculiar light came into Gregory's eyes, a light that neither friend had ever seen there before. He straightened visibly, almost without the aid of his crutch.

"I'll walk yet as well as any one and maybe it will give me back my mental confidence. My mind shall triumph over my body as well as it ever did!"

The artificial leg was duly applied to the hip stump, and it really was amazing to observe the rapidity with which Gregory mastered the art of using it proficiently. Anyone unacquainted with his deformity would never have realized that he did not possess two normal legs.

And then came the automobile accident a week before the time set for the Nelson-Gregory nuptials. How George Gregory's car was struck by an on coming truck, reduced to a junk-heap, and George thrown into a ditch, so that one arm was finally caused to be amputated, never will be known, for George had always been a careful driver. Even with his artificial leg he declared he had no difficulty in putting on the brake. The fall had, as was proved later, caused also internal injuries so that some of the bodily organs did not function properly.

The months that followed were to all who were closely concerned with the accident, like a descent into Hades. Dr. Bell, serving as an interne in the Good Samaritan Hospital, devoted himself untiringly to the tragic case of George Gregory. A world famous specialist was summoned in consultation concerning the internal injuries sustained by Gregory. Very little hope was held out for the life of the unfortunate man, although there was one chance; an artificial kidney.* The vigorous constitution of the invalid came to his rescue. He not only survived the operation but seemed to be in the best of health afterward.

And it is not to be wondered that Rosalind began to doubt whether her love for George Gregory could remain the same as before. Thrown constantly as she was in the company of Dr. David Bell, observing his devoted care and interest in George, she began to compare, or rather to contrast, the two men. George's rapid deterioration was no longer a possible flight of the imagination. It was an actuality. It was no longer possible to overlook the meaning behind his words.

"God expresses Himself through the physical world," he said when the three were together at George's apartment on Kenneth Drive. "He is a Spirit, but He makes Himself manifest in the perfection of a physical world. As much of physical perfection as I have lost, that much of God or Goodness has left me and there are no two ways about it."

Remonstrance was useless, so convinced was the invalid that his theories were correct. Also in his mind there grew steadily an ever increasing dislike for the friend of his college days, the doctor. He could no longer be blind to the fact that it was a struggle for Rosalind to be loyal to him. He was also aware of the growing affection that existed between David and Rosalind. From a dislike his feelings gradually changed to those of implacable hatred for his former chum.

The Parting

AT length after weary days and nights of indecision Rosalind came to the conclusion that she could not marry George Gregory. She longed to tell David of her feelings, but could not because she was conscious of her love for the young doctor. The subject of marriage had not been mentioned by either George or Rosalind since the second accident, but instinctively the girl felt that her lover's previous offer at the time of his lost leg, to release her from their engagement, was not to be renewed; though he must have known that his qualifications as a husband were now fewer than they could possibly have been before.

The moment that Rosalind had dreaded came at last. They were strolling together one evening toward the outskirts of the town. The moon softened, with its silvery glow, objects that in the glare of noon stood out in too bold relief. As they left the highway for the river-path George said:

"Let us set a day for the wedding. I've waited long enough." As he spoke he put around her waist an arm, not one with which nature had equipped him, but one so cunningly wrought that a casual observer would never have known. But Rosalind knew! She shuddered, and in that act, George Gregory knew that his doom was sealed.

"I can't marry you, George," she pleaded in a hoarse, unnatural voice. "I am sorry that it is so, but I cannot do it."

The man laughed and the tones chilled the heart of the girl. "You said once that my identity remained, no matter what the physical imperfections of my body. Now you deny it!" His voice rose in his excitement.

"Listen, oh George," she cried now thoroughly panic-stricken. "You are yourself allowing your mental attitude toward life to be altered. You have admitted it. Had you remained unchanged mentally, I truly believe your physical difference would not have mattered. I loved you for what you were, but, George, you are so changed!"

"Yes I am changed," he shrieked, "but my desires and passions are no different, unless intensification indicates a difference."

He reached toward her, but adept as he was in the use of his two artificial limbs, she eluded his grasp and was off with a bound up the rough river-path and toward the highway. She heard distinctly the sound of pursuit. Could he outrun her handicapped as he was?

**Note: An "artificial kidney" has been invented recently, and tried out successfully on dogs. A cylinder of glass contains a number of celloidin tubes which strain the poisons out of the blood.)*

Once he fell, and the sound of muttered oaths came to her ears. On and on she flew, not daring to look back though she suspected that he was gaining. Just within the border of the town where the houses were somewhat scattered he caught her and simultaneously she fainted away.

When consciousness returned a dear familiar face was bent near her own. With a sob of joy she put her arms about David's neck, and in a few endearing words they plighted their troth.

David, on his way back from a professional call, where he was substituting for old Dr. Amos who was ill, had witnessed from a distance the two running figures. Before he arrived upon the spot with his car, the pursuing form had overtaken the other.

To rescue a maiden from the arms of her lover seemed a very peculiar service to render—but one look into the eyes of George Gregory proved to the doctor beyond the question of a doubt that he was not dealing with a sane man. The contest was an unequal one, though the agility displayed by the cripple would have done credit to a normal man of more than average prowess. David tried to reason with his antagonist, but the use of logic at that time was unavailing. It was a hard struggle, but George was finally willing to admit himself defeated.

A Man Obsessed

ABOUT three months following this incident Dr. Bell (now in possession of the office of the late Dr. Amos) was about to lock up after the afternoon consultations when he heard the approach of a belated visitor in the hall. Looking up he beheld Gregory who passed quickly through the waiting-room and into the inner office, closing the door behind him. The peculiar look of a fanatic, that had become more marked since his second accident, was evident now as he seated himself and turned wild eyes to the doctor.

"Don't be scared, doc," he jeered at sight of Bell's white drawn face. "I didn't come to blame you for winning Rosalind's love, though I confess the thought of your wedding next week goes considerably against the grain. I came for another purpose and I want you to help me."

He rose now and advanced toward the physician. The latter observed the perfect mastery of the artificial limbs, a mastery that proved how well the brain can be trained to control nerves and muscles under unusual conditions. Was all the effort of this brain being turned in that direction to the detriment of a well-balanced reasoning power?

"Here's my proposition, Bell," the words jangled harshly, bringing to a swift conclusion the doctor's thoughts regarding the changed mental status of his one-time friend. "I have decided what I want done. I'll admit that what I'm about to tell you will prove I have a mental quirk which, by the way, corresponds to my physical quirks, but this thing has become an obsession with me."

The speaker leaned forward and held the other's attention with a steady gaze. He then resumed. "I am going to try out an experiment, or rather have it tried out on me, for I shall be a passive factor in this case. I am going to find out how much of this mortal coil I can shuffle off and still maintain my personal identity as a piece of humanity here on earth. In other words, as much of my body as can be removed and substituted by artificial parts, I wish to have done."

During Gregory's recital David's eyes had dilated in horror, and he unconsciously recoiled from his visitor until the width of the room was between them. Not a word could he utter. The seconds ticked away on the little ebony clock on the desk and still the two men regarded each other with unquestionable antagonism.

"Well, will you do it, Bell?" The man pointed significantly to the surgical instruments and the operating table. "I have ample means to pay you handsomely. I'm going to find out about this mortal body and its relation to the soul before I die. You've robbed me of one desire of my heart, but this you shall grant!"

At last Bell spoke, and with the sound of his voice his courage returned. "George, whether you believe it or not, you are a madman and I refuse to comply with your request. If, as you yourself maintain, with the loss of every bodily member, your mental and spiritual powers have waned, what in heaven's name tell me, would you be with only enough of your body left to chain your spirit to earth? I will not aid you in this mad project of yours. Go, or shall I have you taken to the hospital for the insane?"

George Gregory saw that further persuasion was useless. He walked toward the outer office but at the doorway he turned and faced Bell. "There are other surgeons in the world, and mark my words, I shall find out yet by how slender a thread body and soul can hang together."

The Artificial Man

FIVE years passed. David Bell married Rosalind Nelson and built up a splendid reputation as a surgeon. Nothing had been heard in those years of George Gregory. His memory passed as an evil dream and his name was never mentioned. Then one day (it was shortly after the erection of the new county hospital) David and a young interne by the name of Lucius Stevens were putting away the instruments after an operation, when they felt rather than heard the approach of an individual. Turning they beheld the unfamiliar form of a stranger. He was a little under average height. A cap covered the upper portion of his face and a long loose overcoat concealed most of his figure.

"What can we do for you, stranger?" asked Dr. Bell of the silent figure in the door.

"Stranger!" exclaimed the hollow, metallic voice that issued from somewhere beneath the visor of the cap. "I am no stranger, though possibly you do not recognize me. Do you remember your rival George Gregory, Dr. David Bell? I am he."

"You—it is impossible," exclaimed the amazed doctor. "Gregory was a tall man, altogether different in appearance. You—"

"Nevertheless I tell you I am George Gregory and I have come to settle old accounts with you. Clear out," he shouted to the frightened Stevens. "My trouble is not with you."

Lucius lost no time in following the stranger's suggestion. After his departure the two men in the operating room faced each other for some moments in silence.

"Before I have done with you," came the metallic

tones again, "I will explain a few things that may puzzle you."

Here he walked to the office door, locked it and put the key into the overcoat pocket. "Now, sit down, David Bell, don't be in a hurry, for you are not going to leave this room alive. I promise you that, and I am accustomed to doing what I promise."

Bell did as he was bade. The curiosity of his analytical mind was aroused and he wished to find out more about this stranger whose identity he could in no way associate with Gregory. Fascinated, he watched while the man removed his cap and overcoat, and then before David's startled gaze the newcomer placed his right hand to his left shoulder and with a slight manipulation removed the left arm which he propped up in the chair nearest him. He then seated himself and proceeded to dismember himself until nought but a torso, head and one arm remained, all of which were scarred with countless incisions. A mirthless laugh jarred to the depths the doctor's overwrought nerves. The features of the intruder were not recognizable as those of his former friend, Gregory. There was no nose, only two nostrils flat upon the surface of the face. The head was bald and earless, the mouth a toothless gap.

A shudder of disgust went through David, and again the dry laugh of this monstrosity echoed through the room.

"I'm not exactly pretty, eh? But I'm finding out what I wanted to know. After I left you five years ago I went to a famous German surgeon and put my plea to him. He was as interested as I in the experiment, and you see the result. The operations required a period of two years in order to give nature a chance to have the body recuperate in the interim between experiments. As you see me now I am without any parts except those absolutely essential to life. One exception to this however, are my eyes. I did not yet wish to be shut off from the outer world by all of the senses. The artificial internal organs I dare not remove as I do my appendages for they are necessary to my life. The crowning operation of all was a pump replacing my heart. This pump is a simple double valve mechanism which circulates the small amount of blood required for my torso, head and arm. Look here!"

As he spoke he proceeded to reattach the artificial members. After he had again thus assumed semblance to human form he called attention to something David had not noticed before, a flat object lying upon his chest.

"This is the control board," he explained. "With the exception of the right arm I now move my body by electricity. The batteries are concealed within a hollow below the hip of my right leg. Behold in me an artificial man who lives and breathes and has his being with a minimum of mortal flesh! My various parts can be mended and replaced as you would repair the parts of your automobile."

During Gregory's recital David had not withdrawn his fascinated but horrified eyes from the mechanical man. Invulnerable and almost immortal, this creature was existing as a menace to mankind, a self-made Frankenstein. When he was again complete he stood before David, a triumphant gleam in the eyes which alone, unchanged physically, were yet scarcely recognizable as Gregory's, for the soul that peered through these windows was transformed.

In the gathering gloom Bell could see the automaton staring at him. He moved slowly toward a window hoping to elude his antagonist by a sudden exit in that direction, but Gregory crept toward him with a clock-like precision in his movements. The doctor noticed that the right hand was kept busy manipulating the control board at his chest. If this were the case, the interloper possessed only one free arm, but little had Bell reckoned on the prowess of that left arm! Like the grip of a vise the metallic fingers clutched at his throat. One thought pervaded his mind. If he could get that right hand away from the control and damage the connections to the various appendages and organs! But he soon realized how futile were his weaponless hands against the invulnerable body of his adversary. Down, down, those relentless claws bore him. The darkness fell about him like a heavy curtain. A throbbing in his temples that sounded like a distant pounding. Then oblivion.

The Thread Snaps

WHEN David Bell regained consciousness he lying in his bed. The bright sunlight shining through the curtains made delicate traceries across the counterpane. His first thought was that this was heaven by contrast to the events of his last conscious moments. Surely that was an angel hovering above him! No—at least not in the ethereal sense—but an angel nevertheless, for it was Rosalind, her sweet face beaming with love and solicitude.

"Mr. Stevens and I have been watching by your side for hours, David dear," she said as she placed a cool hand upon his brow. "You have him to thank for saving your life, not only at the time of the attack, but during the uncertain hours that have followed."

David turned grateful eyes toward his rescuer.

"Tell me about it, Lucius," he said quietly.

Stevens seated himself in a chair by the bedside and proceeded with this narrative.

"After that demon you called Gregory ordered me from the room, Dr. Bell, I turned over in my mind what had better be done to save you from his vengeance. I thought it advisable to say nothing at the time to Mrs. Bell because I did not wish to alarm her unnecessarily, but I knew that when I forced entrance into the room, it must be with adequate assistance, and within a very short period of time. I made my way to the office as quickly as I could without arousing suspicion. Miss Cullis was at the desk. Knowing I could rely on her natural calmness of demeanor and self-possession, I told her briefly of the danger which threatened you, then I phoned police headquarters. Before ten minutes were over Copeland and Knowles had arrived armed with automatics and crow-bars. I carried an axe. Cautiously we made our way to the door of the operating room and stood without, listening. We heard no sounds of voices and Copeland wanted to force entrance immediately, but I held him in temporary restraint. I wanted to obtain some cue as to conditions on the other side of the door before taking drastic measures. But thanks to Copeland's impatience we broke down the door and saw—I shall

never forget the sight till my dying day—that fiend of hell with his talons gripping your throat. He was evidently somewhat deaf for he heard no motion of our approach. We closed in on him from the rear, but he swung around with such force in that left arm that we all went down like ten-pins. Knowles, as soon as he was on his feet again, struck him several times with the bar, but his efforts were wasted, for he might as well have rained blows upon a stone wall. Copeland aimed for his head in which he knew was encased a mortal brain, but that blow was avoided by the monster's ever active legs and arms. I was reserving my axe for a telling stroke, when it came upon me with sudden clarity of understanding, that the man governed his movements by manipulating the fingers of his right hand upon a place of control at his breast. His right arm and the switch board! These were the vulnerable parts. At last I had found the heel of Achilles!

"While Gregory was occupied with his other two antagonists I dealt a sudden stroke with the axe at his right hand, but missed, the weapon falling heavily upon his chest. My first emotion was disappointment at having missed my mark but in another second I realized that the blow had disabled him. The left arm hung useless at his side, but what prowess it lacked was made up in the increased activity of the legs. He ran, and never have I seen such speed. He would have made Atalanta resemble a snail! However, three against one put the odds too heavily in our favor. Between lurches and thrusts at the flying figure I managed to convey to the two policemen my discovery in regard to his mortal points, and we soon had his trusty right arm disabled. The rest was comparatively easy. We dismembered him. We did not want to kill him, but it was soon apparent to us that the damage done to the control board would prove fatal. He wanted to speak, but his voice was faint, and stooping I could barely get the words.

" 'Tell David,' he said, 'that I've been wrong, dead wrong ever since I was carried off the field in that football game. I had been right at first. Mental perfection does make the physical harmonious, and with the right mental attitude after that accident, I could have risen above the physical handicap. It was not the physical loss of my leg that brought me to this. *It was the mind that allowed it to do so.* Tell David and Rosalind I am sorry for the past, and I wish them much happiness for the future!' Those were his last words."

David Bell and his wife looked at each other with tear-dimmed eyes.

Next day the "slender thread" which had held George Gregory to this world was laid in its last resting place, but the soul which had realized and repented of its error, who knows whither it went?

THE END

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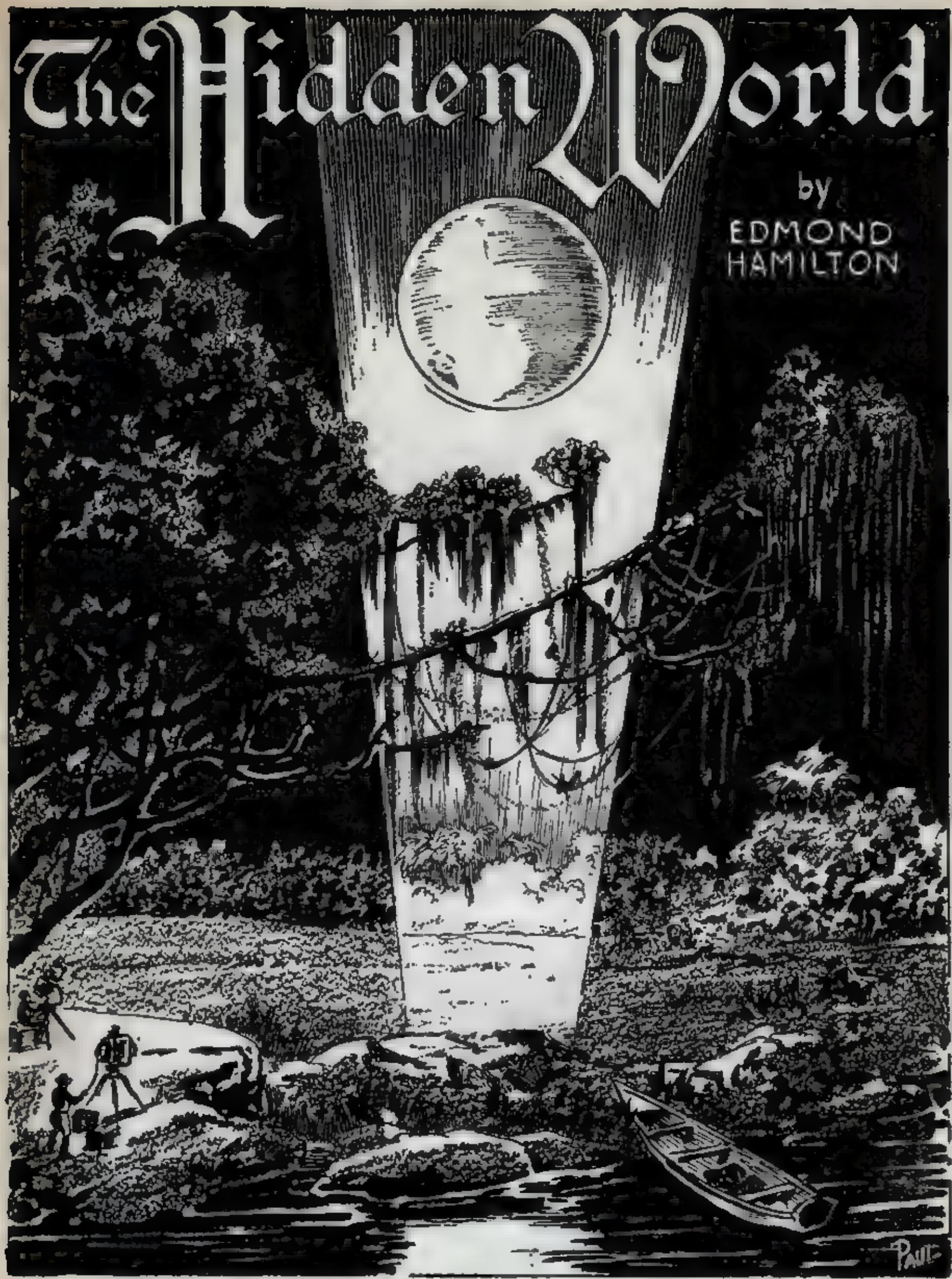
IN THE WINTER SCIENCE WONDER QUARTERLY
On All Newsstands December 15

The Hidden World

by EDMOND HAMILTON



And as it appeared I could see by that inset white spot of light, that the great dazzling column was slowly turning, like a solid revolving shaft!

IT is with a strange wonder that we of earth look back upon the thing today. It is with awe that we remember the dark menace that rose upon us from the hidden world — and how it ended. Nor have I, Arnold Vance, any less of wonder or awe than those about me, for all that I saw that they did not, for all that I stood where never men had stood before at the heart of that dread mystery and menace. For though I lived through the vast, mounting terror of the thing to its colossal crashing end, even to me now it seems strange, and wonderful, and incredible, almost, that the end came as it did.

Four men only were there at the end, though a reeling world bore witness to it when it came. Four men—Dr. Howard Kelsall, Clifton Darrell, Richard Fenton and myself—who dared down into horrors undreamed of by all earth's generations, who alone penetrated into that greater horror that was rising upon the unsuspecting earth. And now that I take up this record of the hidden world and of things that centered upon it, now that I attempt to set upon paper that gigantic succession of events that rushed upon us, it is with us four men, that I choose to begin.

The first and eldest, Dr. Howard Kelsall, held at that time the post of chief geologist of the great Manson Foundation, in New York. It was a much-coveted position, but Kelsall was conceded by all to have merited it. It is unnecessary for me to recapitulate here the achievements that had established his reputation—his great "double-buckling" theory of the formation of the Rocky and Andes mountain-chains, his well-known calculations of the shift in primeval ocean levels, and the others. Suffice it to say that he had won a very real fame, and that that fame had been shared in late years by his chief assistant at the Foundation, young Clifton Darrell. Kelsall and Darrell, though the one was of middle-age and the other in his twenties, were strong friends, and their friendship had come to be shared also by Richard Fenton and myself, two of the Foundation's younger physicists.

An unusual quartet of friends we made, but one which was bound strongly together. At the time when the manifestations from the hidden world began, the time of the appearance of the first light-shaft at Kismaya, we four were sharing an apartment in the east Fifties, all of us chancing to be without immediate families. It was the custom of Dr. Kelsall and myself to walk from this apartment each morning to the Foundation building, the other two preferring the subway. And it was at the end of one of these walks, on a morning late in March, that the first news of the appearance of the light-shafts was given to me, by Dr. Kelsall himself. We were passing up the steps of the great gray Foundation building on that morning when he paused and pulled from his pocket a folded newspaper which he tendered me.

"I forgot until now to show you this, Vance", he remarked, directing my attention to a small article on the folded paper's side. "A strange occurrence—— strange, that is, if it isn't the work of some reporter's imagination."

I took the paper and we paused there at the top of the steps as I read the little article. It was but a few inches in length, a cable dispatch dated from the little coast town of Kismaya, lying in British East Africa, just south of the equator. The dispatch stated that a strange manifestation of light or force of some kind had stricken with panic the entire population of a native village some miles to the north, on the preceding night. In this village, which lay almost exactly

EDMOND HAMILTON

ONCE in a while a story comes along that for sheer daring immediately towers above the usual run of stories.

"The Hidden World," we believe, is such a story. From the standpoint of originality it certainly stands unmatched. There have been stories of the interior of our earth, particularly that by Jules Verne, "To the Center of the Earth," and others. But this is one of the most unusual of them.

The present author, however, has found an entirely new and most unique plan which is as original as it is daring in its concept. A number of astronomical experts have been consulted regarding the possibility of Mr. Hamilton's conception and they proclaim the system possible from an astronomical standpoint, although there is today no scientific information on the subject existing that would lead us to believe that a world such as Mr. Hamilton has invented, exists. That, however, means nothing, because no one has ever penetrated the inside of our world or of any other world, and one hypothesis, therefore, is as good as another.

Incidentally, the author has created a marvellous adventure story in addition to making "The Hidden World" a masterpiece of science fiction. It certainly is one of the most exciting stories that it has been our good fortune to read, and we know that you will not wish to lay down the book till you finish it.

upon the line of the equator, incidentally, there had been on that night two white traders also, who vouched to the truth of the surprising though somewhat incomprehensible story which the terror-stricken natives told.

According to that story, it had been but a few hours before midnight, at the edge of the assemblage of huts that were their habitations. There had been no sound, no warning. A brilliant shaft of blinding blue light had abruptly stabbed upward from the earth at the village's edge to a height of fifty feet. This light-shaft, they said, had been perhaps five feet in diameter, and near its top had been set in its blinding blue light an equally dazzling spot or circular portion of pure white light. For perhaps two minutes the giant light-shaft had towered there, the terror-stunned natives near it frozen in fear. In those moments they had been able to see from the circle of white light in its side, near the top, that the brilliant shaft was turning, was slowly turning around and around. Then suddenly it had sunk and vanished, the ground where it had appeared seeming quite unchanged by its apparition, which sent all in the fear-stricken village racing from it.

The thing was puzzling enough, surely, and as I handed the paper back to Dr. Kelsall I shook my head. "It's past me", I told him. "Sounds like the work of the reportorial imagination you mentioned."

He nodded thoughtfully. "Perhaps so, Vance", he said. "Though the story was corroborated by the white men, and the truth seems quite circumstantial."

The Second and Third Lights

IT must have been, though, that the casual verdict which I rendered thus upon that first dispatch was the one given also by the world at large, for in the days that followed no further reference to the thing appeared in the newspapers. Such strange phenomena, indeed, are not unfamiliar among the dispatches of the great press-syndicates, the greater part of them being hoaxes of one kind or another, so it is not surprising that this particular incident evoked no further interest. I know that I had completely forgotten it by the next day, and Dr. Kelsall made no reference to it in the days that followed. It was not, indeed, until the appearance in the press of the dispatch from Moram Island, some twenty days later, that the first Kismaya affair was jerked back to my memory and to those of many others.

Moram Island, according to this new dispatch, was one of the innumerable islands lying off the western tip of Dutch New Guinea, a few miles to the north of the equator. Besides a number of Dutch planters and officials, it was occupied by the brown-skinned islanders who had always lived there, and it was from planters and islanders alike that this second report now came. The gist of the thing was that, a little before morning on the preceding day, a terrific beam of light had been seen on the sea south of the island.

It had seemed miles to the south indeed, so far that almost it must have been exactly over the equator itself. A great perpendicular shaft of intense blue brilliance, it had shot up from the waters southward like a great beacon through the night, had hovered a minute or two, and then had flashed down and out of sight. The awed watchers on Moram Island had thought it, at first, the beam of some ship's searchlight, but the coming of dawn a little later had disclosed no craft whatever to the southward, making the thing seem quite inexplicable.

In itself, no doubt, this second phenomenon would have aroused but little comment, but the earlier and similar occurrence at Kismaya now made of this second incident something of more interest. Scientists, when questioned concerning it, agreed in attributing the two great light-flashes to falling meteors. They doubted whether the flashes had really lasted for minutes as reported, and also refused to take seriously the details concerning the turning shaft of blue light and the white circle of light upon it that had been reported from Kismaya. A meteor-flash, as they pointed out, is almost instantaneous, though very brilliant. The fact that no meteor had struck the ground at Kismaya they attributed to the burning-up of the meteor and its total annihilation as it flashed downward. The second surprising fact that both flashes had taken place almost exactly upon the equator they explained by the assumption that the earth was entering a thin belt or region of meteors which happened to lie in the same plane with our planet's equator.

This theory, as they pointed out, meant that more meteor-flashes might be expected in the equatorial regions, and though the theory had its defects it was, certainly, the most plausible one advanced. It was true that the great steady shafts of brilliance that had been described by the witnesses at Kismaya and at Moram Island were very different from a meteor's lightning flash downward, but that could be accounted for by the excitement of the witnesses, so that the whole matter seemed satisfactorily explained. In common with the few others who had paused to read of the thing, I let it pass from my mind. And Dr. Kelsall, to whom I knew this second incident would be of interest, was at that time on a short field-trip to the Adirondacks, so that at that time I had no opportunities of discussing it with him, and had forgotten it by the time that he returned.

Three weeks after that second phenomenon, though, the matter was brought forcibly back to my mind and to the world's by the *Callarnia* incident. The *Callarnia* was one of those giant cruise-ships designed to transport a thousand passengers in utmost luxury about the world, and at the time of the incident was heading homeward over the central Pacific from such a globe-circling cruise. It had ventured, in the past months, through the Atlantic and the Mediterranean, through the Indian and the Pacific oceans, and as that day closed was heading

east-north-eastward toward Panama on the last lap of its trip, its position some five hundred miles north of the Marquesas, with the equator's line a little north of the ship.

As the sunset of that day flared westward, therefore, the great ship's passengers had gathered upon its boat-deck, where a group of queerly-garbed sailors were preparing to perform the ancient nautical ceremonies proper to "crossing the line". By the time that twilight had come, indeed, those ceremonies were already going on amid the shouts and laughter of passengers and crew alike, the exact line of the equator lying at that time a little toward the north, the ship forging slowly and obliquely toward it. It happened, therefore, as the dim dusk thickened, intent upon the clowning of the group before them, passengers and sailors alike had no thought of the thing that was to come. No thought until, in another moment, that thing was upon them.

A half-mile ahead of the ship there stabbed suddenly upward through the deepening twilight a shaft of dazzling blue radiance that seemed to spring up from the sea itself and that hung at a height of fifty feet, slowly turning. Near its top was a circle of pure white light by which that turning could be marked, and in that first stunned instant as the passengers and sailors, in answer to a wild cry, gazed toward the blinding shaft, it seemed to them that that shaft extended down to depths inconceivable in the waters themselves, glimmering faintly through them. For a minute, a minute that seemed an eternity to them, that giant beam slowly turned there, and then as abruptly as it had appeared it had snapped down and out of existence, leaving those on the great ship staring at each other white-faced in the darkening dusk.

Kelsall's Theory

SUCH was the tale the great cruise-liner's radio sent sputtering forth, and so related it appeared within hours in the New York journals. And this, the third of these strange incidents, aroused for a short time, at least, an interest which the first two had failed to evoke. Again the thing had happened, and upon earth's equator as in the first two instances! The matter seemed to many startling for that reason, but the scientific authorities questioned concerning it only boredly referred their questioners to their earlier statements. The thing, they said, was but another instance of meteor-fall as had been the first two, and happening at the equator as they had confirmed the theory that the earth's equatorial regions were in the plane of a thin meteor-belt through which the earth was passing. The statements of those on the *Collarnia* to the effect that the great blue shaft of light had remained for a full minute or two, and had slowly turned with its white circle of light upon it, the scientists discredited. For, as they explained, a meteor's brilliant flash caused by its burning up before it can reach earth's surface, often, is so intense as to impress the visual nerves with a sense of duration for longer than is really the case, and to delude them concerning its real appearance.

This explanation, reasonable enough, was concurred in by those newspapers which made independent comment on the strange triple incident. Desirous as they were of a sensation, they were aware that the flashing out of three brilliant light-shafts on three far regions of earth's surface was of but little intrinsic interest to their readers, save for a few of the more scientifically inclined. So that though for a day or so they published what comments they could gather on the *Collarnia* incident, the very lack of further developments in regard to it could not but make it soon of no more interest to them. And so, quickly enough, this third strange phenomenon was forgotten by newspapers and readers as had been the first and second.

My own interest, though, had been definitely caught by the strange recurrence of the phenomenon, and I resolved to discuss it with Dr. Kelsall, who had shown such interest in its first happening. When I reached our apartment that evening, though, I found that Dr. Kelsall had not yet arrived at it from the Foundation, nor was he there when Darrell and Fenton and I returned there after dinner. It was natural enough, however, that this subject uppermost in my mind just then should have entered our conversation, and we were engaged in a discussion of it when Dr. Kelsall finally entered. I apprised him, briefly, of the subject of our talk, but to my surprise when I had done so he ventured no suggestion on the thing, but sat beside us in silence. Gazing out beyond us, as we watched him in silence for the moment, his strong face and keen steel-gray eyes seeming brooding upon something, he sat there for moments unspeaking before turning finally toward us.

"Darrell—Fenton—Vance—" he said, his eyes moving over us. "It's about this thing that I wanted to talk to you tonight."

"This thing—these three light-shafts?" asked Darrell, and Kelsall nodded.

"Yes," he said, "these three great light-shafts, that have flashed into being, one after another, at three different spots around earth's equator. And what, in your opinion, caused those light-shafts to appear? Meteors?"

Darrell shook his head. "No, that's what we were discussing when you came in, Kelsall, and had decided that they couldn't be meteor-flashes. For all who saw them say, apparently, that they were great beams or shafts of light instead of flashes, and no meteors were seen or heard. Yet what, then, could have caused them?"

"I do not know that," Kelsall said quietly. "But one thing I do know, a thing that none other on earth has guessed. I know where and when the next of these enigmatic light-shafts will appear and I propose that we four go there and solve the mystery of them when it does appear!"

Astounded, we stared toward him, but then before we could ask him a question of the many that

whirled suddenly in our brain, he had turned and had taken the small globe from the table beside him, had turned back to us and was speaking quietly on.

"Before you can understand the thing that I have discovered," he said, "you must understand the locations in which these three strange light-shafts have appeared on earth. Now as you know the first light-shaft appeared just north of Kismaya in British East Africa, just on the equator, on the night of March 22, two and one-half hours before midnight. The second," and he spun the globe a little, "appeared here on the equator just south of Moram Island, off New Guinea. Both light-shafts, as you know, as all noticed, appeared almost exactly upon earth's equator. But there is a stranger thing that no one else noticed—and that is that the second light-shaft appeared just one-fourth around earth's equator from the first!

"Strange, is it not? Yet here is something as strange. Here at this dot I mark on the blue of the Pacific is the latitude and longitude reported by the *Callarnia* on the evening that the third light-shaft appeared before it. That dot, that position of the third light-shaft, is exactly another fourth around earth's equator from the position of the second light-shaft, exactly a half around earth's equator from the first! In other words, these mysterious shafts of brilliant blue light have flashed into being in a regular progression around earth's equator, each appearing exactly upon that equator, and each appearing exactly a fourth around earth's circumference, from the last one!

"Now, that being so, can it be doubted that when the fourth light-shaft appears, it will appear in the same regular progression, at a spot another fourth around earth's equator from the third? Thus one has only to measure with accurate maps from the position of the third light-shaft, a fourth around earth's equator, to find the spot where the next light-shaft will appear! And that is what I have done today, and doing so I found that spot. It lies in the Brazilian jungles just north of the Amazon River's mouth, a spot lying between two little-known rivers, the Malgre and the Tauraurua, which join each other exactly at the equator. So that it is upon the ground between those two joining rivers there in the Brazilian jungles, that the next of these strange light-shafts will undoubtedly appear!

"But you will say, when will it appear? Well, if you will reread the accounts of the three light-shafts, you will discover that each was separated by as regular intervals of time as of space. Exactly twenty days, and six and a half hours, elapsed between the appearance of the first light-shaft at Kismaya and the second at Moram Island. The same exact interval of twenty days and six and a half hours elapsed between the Moram Island appearance and the sighting of the third light-shaft by the *Callarnia*. With this regular progression in mind, therefore, it cannot be doubted that the same interval will separate the appearance of the third and fourth light-shafts, if a fourth appears. So that we can say positively almost that if that fourth shaft appears it will do so twenty days and six and a half hours from this last one, which sets as the time of its appearance a half-hour before midnight on the night of May 21st, more than two weeks from now. And I propose, now, that we four be there when it does appear!

"For who can tell what mysteries lie behind the appearance of these strange, terrific light-shafts? Who can tell what we four might not learn if we were present, ready to study it? We alone of all men know where and when it will appear, if it does appear, and shall we not then endeavor to penetrate their mystery? And mystery it is, I think, that lies behind them. For how comes it that these shafts of brilliance, which could not have been made by any known device of men, yet have appeared around earth's equator with human and more than human exactness and regularity of time and place? What is their unfathomable cause, their purpose? To us four is given the chance to solve these questions. In that solution it may well be that we will penetrate into mysteries and into forces as yet undreamed of by any on earth. And you, Darrell and Fenton and Vance—will you not go?"

There was a moment's silence at his final question, a silence in which, with minds strangely awhirl from the things that Kelsall had spoken, we gazed at him, and at each other. Then suddenly, as our eyes met, we knew without words each other's thought, and Darrell turned to Kelsall, speaking for all of us.

"We're with you, Kelsall," he said quietly. "Whatever mystery lies behind these light-shafts, we're going with you to solve."

CHAPTER II

The Spheres from Below

"A HALF-HOUR before midnight on May 21 the fourth light-shaft should appear—and that's but six hours from now!"

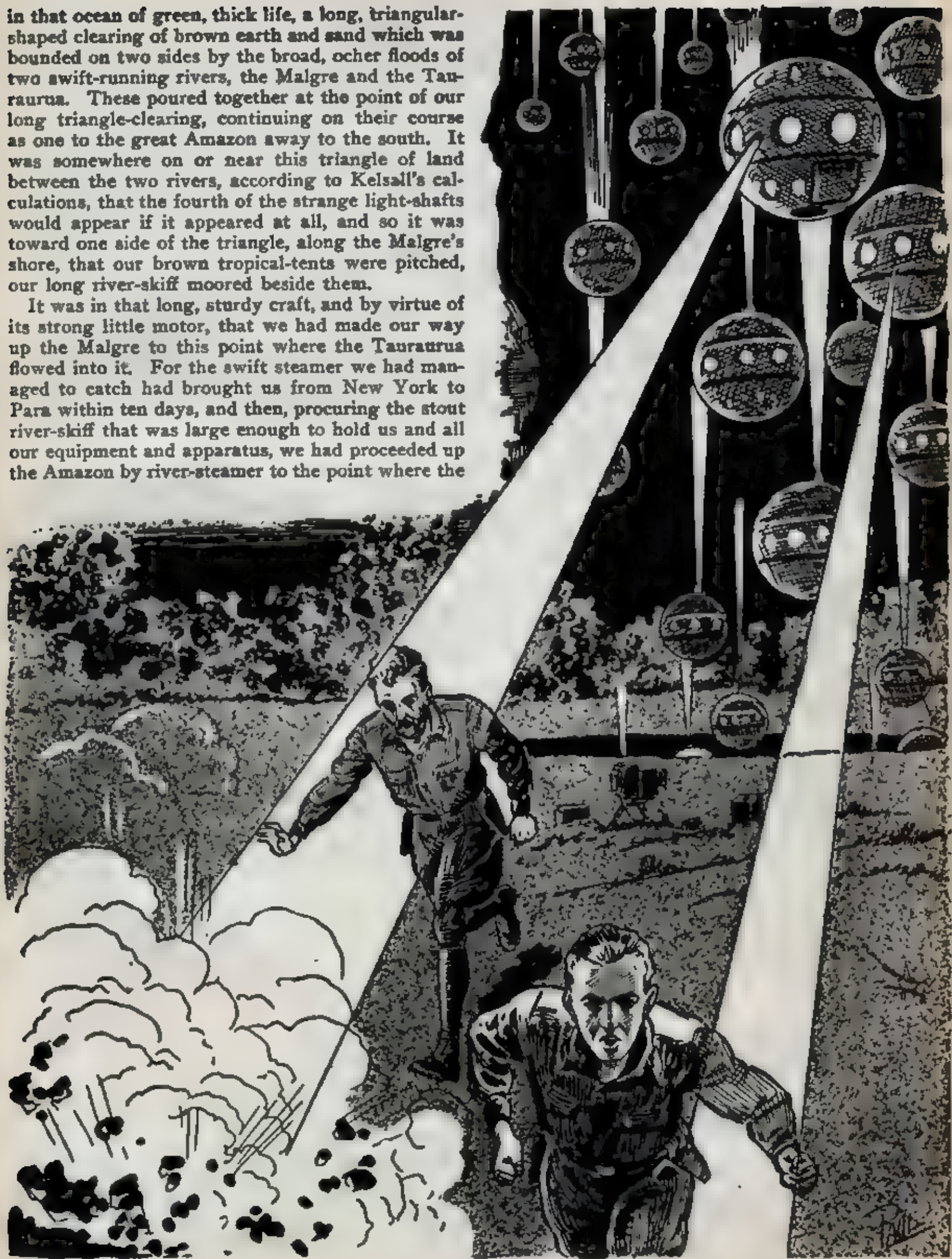
It was Dr. Kelsall who spoke, and as he replaced in his pocket the watch at which he had been glancing, we four turned for the moment from each other, gazing about us.

Around us there stretched away in all directions the vast green solitude of the Brazilian jungle, a tremendous solid mass of vegetation that seemed to lie like a great blanket over the earth. The great, close-packed trees, the thick vines and lianas that bound them everywhere together, the impenetrable plant-life that choked the lower ways between them, swarming with brilliant-hued birds and monkeys and strange insects, with larger animals stirring beneath—these extended out from us on all side, lit now by the waning glory of the sunset to the west. The whole scene about us impressed one most with the illimitable fecundity of the life, plant and animal, with which it swarmed, and it was a fecundity of life, so dissociated from anything human, that it was strangely depressing.

We four, however, were standing upon an island

in that ocean of green, thick life, a long, triangular-shaped clearing of brown earth and sand which was bounded on two sides by the broad, ocher floods of two swift-running rivers, the Malgre and the Tauraurua. These poured together at the point of our long triangle-clearing, continuing on their course as one to the great Amazon away to the south. It was somewhere on or near this triangle of land between the two rivers, according to Kelsall's calculations, that the fourth of the strange light-shafts would appear if it appeared at all, and so it was toward one side of the triangle, along the Malgre's shore, that our brown tropical-tents were pitched, our long river-skiff moored beside them.

It was in that long, sturdy craft, and by virtue of its strong little motor, that we had made our way up the Malgre to this point where the Tauraurua flowed into it. For the swift steamer we had managed to catch had brought us from New York to Para within ten days, and then, procuring the stout river-skiff that was large enough to hold us and all our equipment and apparatus, we had proceeded up the Amazon by river-steamer to the point where the



There had stabbed from the spheres other narrow beams, yellow instead of white. The rays shot over and past Kelsall and Fenton, and we saw the ground where they struck seemingly gouged by a giant invisible hand—a great crater scooped suddenly from it.

Malgre flowed into it. There, leaving the steamer, we had begun the most toilsome part of our journey, the slow fight upward against the Malgre's current, through jungles that stretched to the north to and over the Guianas, jungles swarming with animal life and with their only human inhabitants a few half-glimpsed brown Indians. It was the great wilderness of the Brazilian Guiana into which we were penetrating, and so toilsome was our progress that had our goal been but little farther we could never have made it before the calculated time.

As it was, it had only been on the preceding day that we had reached this triangle of clear land. Until the present moment we had been busy in arranging the apparatus. That apparatus had given us anxious moments in our rough journey upward in the skiff, for much of it was of a super-sensitive and delicate nature. There were black-cased cameras, cinema and still types, some equipped with various ray-filters and screens. Square fluoroscopes lay ready beside the delicate galvanometer circuits and electroscopes that had been set up by Fenton and myself. If a fourth great light-shaft appeared near us, indeed, it would be strange if we four with the comprehensive equipment which we had set up would not be able to record the shaft's appearance and to determine, even though it lasted but a minute or two like the others, its nature, whether electrical or radio-active or simply light.

We were ready, indeed, for the coming of the fourth light-shaft, yet now as we four stood there, brown-garbed, white-helmeted figures with heavy automatics swinging always at our hips, it was with an oppressing doubt that I gazed about me. The whole vast wild scene about us filled me with misgivings. Had we come, after all, on a wild-goose chase? Had the appearance of those three light-shafts, after all, been due only to some freak of natural forces, the regular progression in time and space of a mere coincidence, and had Kelsall been far afield in his belief that here where we stood another light-shaft would appear within a few hours? These were the questions that troubled me as we stood there together, watching in silence as the sunset westward flared and faded, and at last, turning to the others, I expressed some of my doubts.

"The whole thing seems rather incredible, doesn't it?" I asked. "Incredible for us to expect a fourth light-shaft to appear at this exact spot."

I indicated with a wave of my hand the thick walls of jungle that rose around our river-bordered clearing, and Darrell and Fenton gazed silently around at my gesture. Kelsall, though, shook his head.

"No, Vance," he said, "if a fourth light-shaft appears it will do so here and at a half-hour before midnight. I'm certain of that—for the appearance of the other three have been superhumanly exact in time and place."

"But there's nothing unusual here," I said. "We've explored thoroughly all this clearing and the region immediately around it, and we've found nothing unusual—no sign of the presence of human life, even."

"There was nothing strange or unusual there at Kiamaya, or south of Moram Island, or before the *Callania*." Kelsall reminded me, "yet the light-shafts appeared there. And though no other humans lie within leagues of us, I think that there is nothing human behind the mystery of these light-shafts which we have come here to solve."

"But our plan of action?" questioned Darrell. "In case the fourth light-shaft does appear it will last only for seconds, and we'll need to be quick if we're to gather any data on it in that time."

Waiting For Midnight

KELSALL nodded. "Yes, Darrell, and for that reason we'll take up separate stations when the time approaches. I want you and Vance here to take up a position at the north or broad end of this triangular clearing, just at the jungle's edge. You will hold the two cameras, ready to turn them upon whatever spot the fourth shaft appears, if it does appear; Vance, who like Fenton is a physicist and understands such work better than we, can use the fluoroscopes to determine whether the shaft is fluorescent in nature. Fenton and I, on the other hand, will station ourselves down at the clearing's point, on the open sand, and Fenton can watch his electroscope and galvanometer circuits while I use the spectrograph on the light-shaft. In this way if the light-shaft appears in this vicinity as it should, even though it lasts for but a minute or more, we should be able to determine accurately its nature and gain enough data to enable us later to discover its cause."

"You have no theory yourself as to that cause, then, Kelsall?" asked Fenton curiously. "You've never ventured any to us, but you must have some thought concerning it."

Kelsall's face grew grave at the question. "I have a theory," he said, slowly, "but not one I want to mention now. A theory which to my mind can alone account for the appearance of these strange shafts of light, yet which is so startling, so insane, almost, that even you could not take it seriously now. But if another light-shaft appears here, if we cannot discover its nature, it may be that the thing that has suggested itself to me will be corroborated by our evidence. And if that is so——"

He did not finish, but as Darrell and Fenton and I stood there beside him, regarding him, something of the strange suspense, the fear almost, that held him, was communicated to ourselves. So it was in silence that we stood there still, while the last colors of the sunset faded westward, while the deep tropical twilight stole westward across the world like a veil drawn after the descending sun. Swiftly then the darkness of night, soft and velvet-like, was upon us, with the brilliant constellations of the equatorial sky burning out brightly overhead, with a strange tremor and stir of renewed and re-awakened nocturnal life running through the dark-massed jungles on all sides of us. Night was upon us, and soon now there would be upon us also that hour, that moment, for which we had trailed to this spot, so now we began to follow Kelsall's or-

ders and to arrange ourselves and our masses of apparatus about the long clearing.

At the long triangular clearing's northern end, its broad base in effect, Darrell and I quickly set up our cameras and fluoroscopes, just at the edge of the thick wall of the jungle. That base or side of our triangular clearing was perhaps three-quarters of a mile in width, and from that jungle-bordered base the clear triangle of ground stretched southward, bordered on either side by the two swift rivers, for a similar distance, to the long sandy point where the two rivers converged, the triangle's tip. It was upon that tip now that Kelsall and Fenton, in turn, set up their own apparatus, their spectrographs and electrical apparatus, Darrell and I helping them and working without hamper in the clear thin starlight that lit all the clearing. This done, the four of us met again for the moment at the clearing's center, before taking up our positions with our apparatus.

Kelsall clasped the hands of Darrell and myself strongly. "Darrell—Vance—", he said, "I know that you will do your best on this. Be ready, and if the light-shaft does appear anywhere within sight of us, get your instruments on it at once."

Darrell nodded, raising his hands for the moment to the shoulders of Kelsall and Fenton. "We'll be ready for it," he said. "And if nothing happens—well, we'll have done our best."

With these words, we turned, and then the four of us had separated, Darrell and I striding toward the clearing's northern jungle-wall where our instruments lay ready, while Kelsall and Fenton started for the sandy tip that was to be their position. We had retained our heavy pistols, the profusion of fierce wild life in the jungles about us making that a necessary precaution. At our position we crouched down among our instruments. Our last preparations had been made, and our wait for the appearance of the fourth light-shaft began.

A glance at my watch showed me that there remained still more than two hours before the coming of that moment, a half-hour before midnight, which Kelsall had calculated as the time of the next shaft's appearance. We had begun our watch thus early, at his own suggestion, in case that those calculations might have been a little inaccurate, and so would be ready for the light-shaft's appearance even though it came an hour or so ahead of time.

We waited in silence for that thing which had brought us to this savage and remote spot. Far down at the clearing's tip we could make out in the starlight the dark, vague shapes of Kelsall and Fenton, crouched likewise with their own equipment, but they were as silent as ourselves.

I found myself listening, in that silence, to all the myriad strange sounds that came from the thick jungle behind us, the distant coughing snorts or dull trampling sounds of large animals, the shrill sounds of countless insects, the occasional swashing of large lizards or reptiles in the rivers to east and west. The sullen heat of the day, the burning heat of the equator upon which we were, had declined only a little with the coming of darkness. And as the minutes dragged past with no other sight or sound save those of the profusion of jungle life about us, as the great tropical constellations sloped majestically across the sky, to my physical discomfort was added the return of my troubled doubts.

The Light Appears!

IT seemed to me incredible, almost, that we four should have found reason enough in the facts that Kelsall had discovered to bring us to this wild spot, far from civilization's farthest outposts, in the anticipation of witnessing a repetition of the three phenomena that had already occurred. It seemed insane, almost, for us to expect that a fourth of those strange light-shafts was to appear at exactly this spot, at the exact time that we had calculated. And as that time slowly approached, as my watch's hands steadily approached to the position that would mark the half-hour before midnight, and as no slightest unusual sight or sound came from anywhere about us, I felt the doubt becoming stronger and stronger.

Darrell, though, was beside me as silent and unmoved as ever, and far down at the clearing's tip I could make out still the dark figures of Kelsall and Fenton, waiting, like ourselves. With watch in hand, now, I watched the larger hand slowly moving toward the half-hour position, only minutes remaining now until our calculated moment would arrive. Slowly, minute by minute, that hand moved, and now was within a half-dozen minutes of the half-hour, yet from about us had come nothing new. Now it was within four minutes, three, two, one——Tensely Darrell and I were watching it, now, as the watch's hand moved at last within a single minute of the awaited moment our hands had clenched unconsciously with suspense.

Then at last, seeming infinitely slow, the hand had moved to the half-hour position, and with our nerves taut with suspense, with our hands ready on the instruments before us, Darrell and I waited, gazing about us, gazing at—nothing! No single gleam of light had appeared in that moment in all the dark mass of the jungle about us and behind us, no light-shaft or sign of one! Gazing for the moment at each other, sick with disappointment in that moment, Darrell and I rose to our feet, while down there at the clearing's tip we saw Kelsall and Fenton rising even as we did. We had failed! Our plan, by which we had thought to solve the mystery of these strange light-shafts, had proved futile, after all. I took a step forward, to go down to Kelsall and Fenton, disappointment wrenching still at my heart. A single step forward I took, and then, abruptly, I had halted in my tracks while at the same moment there had burst a hoarse cry from Darrell, behind me.

There before us, at the center of our great triangular clearing, almost, half-way between ourselves and our two friends at the tip, there had stabbed

suddenly upward a terrific beam of brilliant blue light whose dazzling intensity in that moment seemed blinding to my eyes! Fifty feet upward from the clear ground of the clearing it towered, a tenth of that in diameter, and even as I shrank back in that instant from its awful, soundless appearance, even as I heard the cries of Darrell and Kelsall and Fenton, I had seen that near the shaft's top was set in some strange way a circle or disk of pure white light, as brilliant as that about it! And, as it appeared, I could see by that inset white spot of light that the great dazzling column was slowly turning as it towered there, turning like a solid revolving shaft!

In the single instant of the terrific beam's appearance I had glimpsed these things, and then had leaped back to the black fluoroscopes which in the next moment I had trained upon the shaft. Beside me I heard the rapid clicking of Darrell's cameras, knew that even at that same instant Kelsall and Fenton would be working with their own instrument. Because they were a modern recording development of the old time visual fluoroscopes, I knew that if the light before us was of a fluorescent nature that fact would be recorded instantly upon their screens. So I swiftly exposed them, one after another, to the great towering shaft of blue brilliance that loomed before us

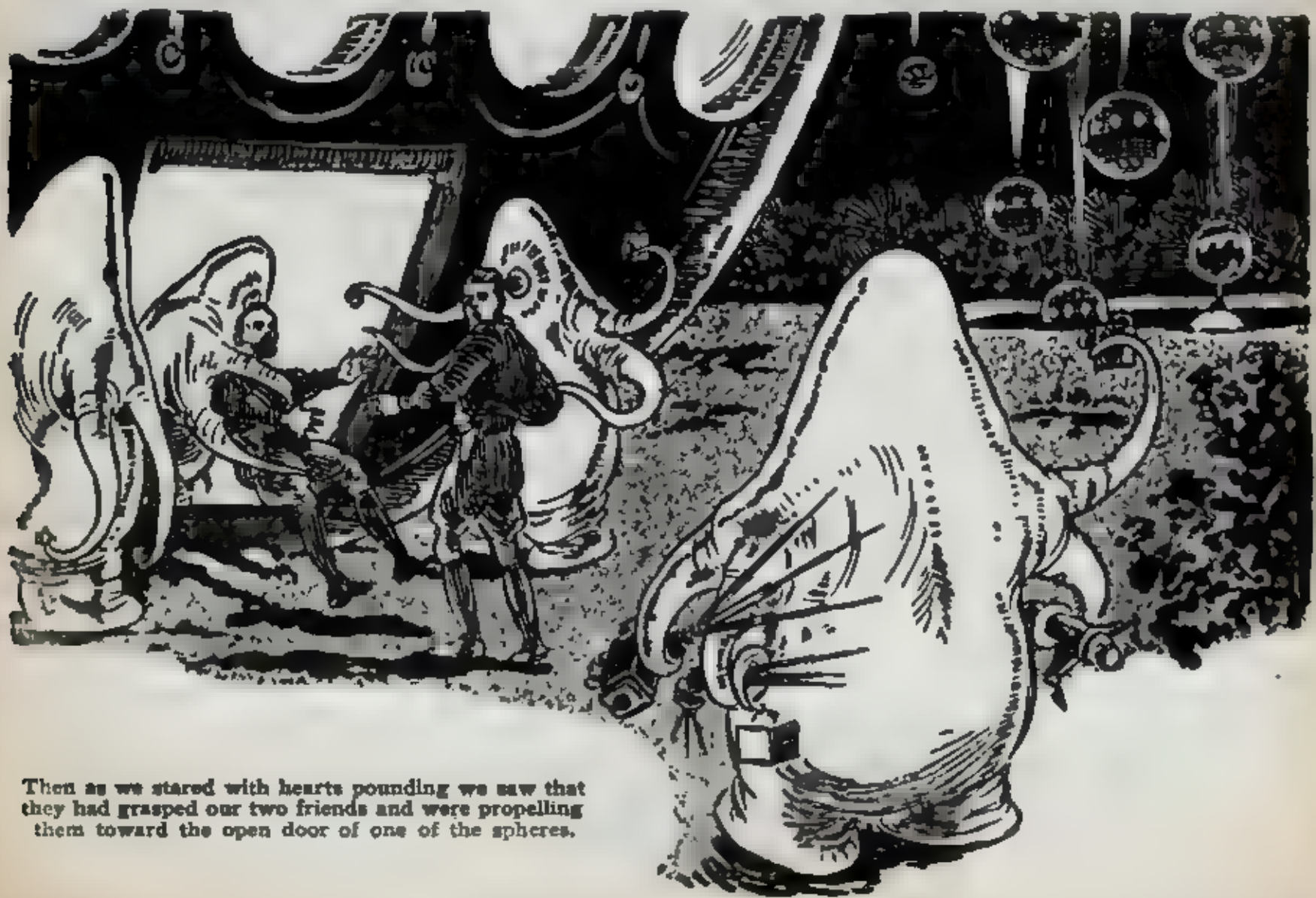
Surely that scene must have been one of infinite strangeness——the tropic night all about us, the awful giant beam towering there so strange and terrible, the figures of us four men to north and south of it, standing out like all things about us in its blue glare, and working like madmen in that moment with our instruments to record all available data. Around and around the thing turned for more than a minute, the white-light spot upon its blue, brilliant column moving around with each turn. But that minute seemed to us drawn into hours. Then abruptly, as strangely and swiftly as it had appeared, it seemed to flash downward, to vanish like an extinguished light, leaving us there in a darkness that seemed deeper than before!

"It came——as Kelsall thought"——"but in God's name, man, what can it be?"

"Whatever it is we've got our data on it!" Darrell was exulting. "And there come Kelsall and Fenton, now——."

Kelsall and Fenton had risen and were striding excitedly toward us, calling to us in answer to our own shouts as Darrell and I strode to meet them. They were within a few hundred yards of us, I think, the ground where the great light-shaft had appeared lying between us, when a thing happened the mere memory of which sickens me with dread to this day.

In one lightning instant the thing had happened. There was a gigantic stabbing flash of yellow light that flared for a moment blindingly before us, and at the same instant there broke from about us a titanic thunderous detonation that was like the crash of colliding planets! Slammed down against the ground by that terrific detonation, we were aware in that instant of only the stunning light and sound loosed before us, and then the thing was over, an almost thunderous silence following. But before us now, between our two groups, between that of Darrell and myself and that of Kelsall and



Then as we stared with hearts pounding we saw that they had grasped our two friends and were propelling them toward the open door of one of the spheres.

Fenton, there yawned in the clearing's surface the black mouth of a great shaft or well, five hundred feet in diameter at least, and perfectly circular in shape! And as Darrell and I staggered to our feet at that giant shaft's edge and stared downward into it, even as Kelsall and Fenton were staring tremblingly down on its other side, we saw by the starlight that fell from above into it that the great shaft dropped down to depths inconceivable, endless!

I think that in that moment as we stared down into the black and awful depths of that circular abyss we were too stunned in all our senses to comprehend even what thing lay before us. Mechanically, unthinkingly, we stared down into the great shaft, noting only in that moment that it was as perfectly cylindrical in shape as though bored by a giant drill, that its smooth sides, cut unerringly through rock and soil alike, fell vertically downward to a point where even the white starlight from above could not illumine the tenebrous depths! Then, as we stood there, I cried out inarticulately, pointed downward.

In the awful blackness of the great shaft's depths a tiny point of white light had appeared, and was growing larger! And even as we gazed down toward it with minds reeling from the import of the thing we saw, we glimpsed other light-points appearing beside and around it, other little white lights there far, inconceivably far, beneath, growing larger with each second as at immense speed they rushed up toward us! Growing larger until in moments more, as we gazed there, we could see that those white lights were flashing, brilliant white beams, beams that were flashing upward from great dark round objects that were racing up the shaft toward us! And in the next moment we recognized them as great metal spheres!

Each a full twenty-five feet in diameter, and massed together in a swarm of a full hundred or more, they were rocketing up the shaft toward us! From each of them flashed a white beam of brilliant light by means of which they held their course straight upward through the great shaft! Racing up toward us at speed unthinkable! And as they shot up toward us, with a humming sound, there came to my stunned ears a wild cry from Kelsall, standing there across the great shaft's rim from ourselves.

"Spheres!" he was crying madly. "Sphere-ships from inside the earth! Darrell——Vance——I see it all now, the light-shafts, this opening, the spheres ——get back, for God's sake, get back from the shaft!"

CHAPTER III

The Things of Flesh!

THE next moment, as Kelsall's wild cry echoed in our ears, I was aware only of Darrell beside me clutching my arm, jerking me back, and of a wild, nightmare rush toward the wall of the jungle north of us which we had left a few minutes before! I glanced back for one instant, glimpsed Kelsall and Fenton running back from the great shaft, running back toward the clearing's tip, Darrell and I almost to the jungle's dark mass, were flinging ourselves toward it with one last effort. And as we did so I heard a sudden humming in the air behind us, and then even at the moment that we hurled ourselves inside the jungle's thick cover I had half-turned and had seen that the swarming metal spheres, their white beams flashing still, were emerging from the shaft into the open air!

The next instant their great swarm or mass was halting, hanging there above the shaft, and their beams of light were stabbing and circling swiftly in all directions through the night, questing and searching. Crouched there in the thick undergrowth behind the trunk of a great tree, we realized that our bolt to the jungle's protection had saved us, for they had apparently not glimpsed us. But as we crouched there in that moment, I glimpsed Kelsall and Fenton running still toward the clearing's tip, over its bare surface, and then dozens of the circling beams had caught the two running men in their illumination and as they did so scores of the hovering spheres were leaping through the air toward them!

Instantly Darrell and I were on our feet, were on the point of leaping back out from our cover, for the spheres flashed after the running Kelsall and Fenton there had stabbed from them other narrow beams, yellow instead of white. These yellow rays shot over and past our two friends, striking the ground just beyond them, and as they did so we saw the earth where they struck seemingly gouged by a giant invisible hand, a great crater scooped suddenly from it where those rays struck, while at the same instant there came to our ears a bursting detonation of sound! As the ground before them vanished thus, seeming to disappear simply before us with the speed of light, Kelsall and Fenton halted, stunned, and then the yellow rays had snapped out and the rushing spheres had completely surrounded our two friends, had come swiftly to the ground in a circle about them!

Darrell jerked me back down into our cover. "Wait, Vance!" he whispered tensely. "They haven't harmed Kelsall and Fenton yet—wait here and maybe we can save them yet!"

Down again into our sheltering undergrowths we crouched, and then as we gazed forth could see by the clear starlight that the globes which had come to rest around our two stunned friends were more than a score in number, the remaining scores of the great spheres hanging still over the great shaft. Now, as we gazed with hearts hammering, we saw that in those metal spheres were transparent circles or windows. In the ones around Kelsall and Fenton round sections of the curved metal spheres were swinging open, doors opening. Then out through those doors from the interior of the spheres there had moved toward our two friends some scores of creatures, creatures at the sight of which Darrell and I clutched each other's arms with sudden fierce intensity, our brains spinning.

For the creatures that moved out of those spheres into the clear starlight and the light of the circling beams were surely such as men had never looked upon before. They were, each of them, a great white mass of flesh that seemed shapeless and sack-like, almost, a mass fully seven feet in height and half that in width, the upper part of the flesh-mass tapering a little in width. Each was upheld by two thick and equally shapeless lower limbs, each half

the thickness of the body it supported and each hardly more than a foot in length. Just above these limbs, at the foot of the shapeless body-mass, there projected the two equally short and thick upper limbs or arms, each ending in two tapering tentacles or feelers. Above these grotesque arms towered the great white mass of the body itself, and set in the upper part of that headless body, directly in its white mass, were the only features visible, a single dark and saucer-like eye inches across and circular in shape, with beneath it a horizontal row of seven small round apertures in the body which seemed the thing's mouth.

Such were these things that moved out of the spheres toward the motionless Kelsall and Fenton, as horror-stricken as Darrell and myself. And as they moved out I saw that it was only with great effort that they moved, that their strange thick limbs seemed to buckle and bend beneath them, and that to all appearances they were quite boneless, as I was to learn later was the truth. Great things of flesh with no skeleton or bones of any kind within them, great headless things moving slowly, half-dragging themselves forward, out of their spheres toward our two friends! I saw, even through the daze of horror that had settled upon me, that a number of those flesh-creatures held within the tentacled grasp of their strange arms small cubes of the same metal as their spheres, and could comprehend by the carefulness with which they kept the cubes held toward Kelsall and Fenton that they held the same terrible yellow rays that we had seen gouge so swiftly and incomprehensibly that crater in the earth.

Captured

BUT now, though, while Darrell and I gazed forth transfixed with horror, we saw that the great flesh-things were regarding our friends fixedly with their great single staring eyes. Kelsall returned their stare, trembling a little, and I could see Fenton's hand steal down to the automatic at his hip, then move away from it as though he realized that to use it would mean certain death instantly for Kelsall and himself. Then from the foremost of the great flesh-things, who swayed there with his efforts to hold his great weight erect upon his thick and boneless limbs, there came a strange succession of high, whistling sounds, sounds that seemed to have their origin in the row of seven small openings beneath his eye. It was as though the thing was expelling air through those openings to produce those whistling sounds, rising and falling swiftly in modulations which made it evident enough that the creature was speaking, speaking in his own strange way to our friends.

To that whistling speech, though, neither Kelsall or Fenton made reply, simply shaking their heads in a very evident gesture of lack of understanding which must have been read correctly by the creature before them. For a moment longer he contemplated them, then turned a little and directed for a brief moment his whistling speech at some of the other great flesh-things about him. At once they moved forward, moving with infinite efforts as though their great weight had been suddenly increased to a point where they could only move it and hold it erect by great efforts. Toward Kelsall and Fenton they moved, and then, as we stared with hearts pounding from our cover, we saw that they had grasped our two friends and were propelling them toward the open door of one of the resting spheres!

As comprehension of that action's meaning came to us, as we understood in another moment that these strange creatures were bent upon taking Kelsall and Fenton, prisoners, down to whatever strange depths they had risen from, Darrell and I uttered low exclamations, at the same moment straightening and taking a step forward from our cover. Another moment, I knew, we would have burst forth into the starlight of the clearing in a wild effort to rescue our two friends, regardless of the death that must have rewarded such an attempt. But as we straightened there, as Kelsall was marched toward the open sphere with his companion, I saw him gaze for the moment in our direction, a furtive glance as though to assure himself of our escape. And when his eyes discerned our two figures there, on the point of rushing out to him, we saw him make a swift and surreptitious gesture toward us, a gesture that as plainly as words warned us back! A moment we stood irresolute in the face of that gesture, the attention of the flesh-things in the clearing upon our two friends, and then as calmer second-thought came to us and made us recognize the hopelessness of such an attempt, we sank back into our cover.

Crouched there, Darrell's hand gripping my shoulder tightly, we watched as Kelsall and Fenton were ordered inside the sphere before them. Then there followed them inside a number of the flesh-creatures, the door was closed and with a sudden hum of power the sphere and those resting about it rose upward. The great metal globe that contained our two captured friends moved with a half-score others downward, into the great shaft with swiftly mounting speed, and out of our sight. Whatever strange and unsuspected world within earth's depths these flesh-monsters had come from, it was back down toward that world, we knew, that Kelsall and Fenton had now been taken!

"Captured!" My whisper as we crouched there was one of hopeless despair. "Captured—Kelsall and Fenton—and God knows into what horrors beneath they've been taken!"

"Steady, Vance," whispered Darrell beside me. "Our one chance to get Kelsall and Fenton free, to get ourselves free, is to keep from being discovered by these things now."

Darrell's caution to me came none too soon, for now with the other spheres and that holding our friends having disappeared down into the shaft, the great mass of spheres hanging above the clearing was moving again. Still more than a hundred in number, the humming of their operation sounding to our ears like the droning of a great beeswarm, they were moving off in different directions, were taking up a new formation. That formation was one of a great ring, a ring that expanded until it formed a circle of perhaps a mile diameter of which the clearing and the shaft was the center. In that ring the hundred spheres moved slowly and steadily, one taking the place of the other so that they held always that formation, circling slowly and smoothly over the jungles. It was plain enough, then, that these hundred circling spheres were guarding that shaft, were watching

all the country directly around it for possible intruders, their white beams searching downward and outward as they hummed on in their ceaseless watch.

Three of the great spheres, though, had separated from the others when they took up that formation, and had descended until they had come to rest at equal distances from each other around the great shaft's rim, one of them being on the side of that rim nearest ourselves. Then as Darrell and I watched them intently, the round doors of those three spheres had opened and out from them, slowly and with great efforts, had emerged a half-dozen or more of the flesh-monsters from each, two or three of the things remaining in each sphere. These grouped together at the great pit's edge, and as they stared down into it with their strange great eyes we heard the whistling sounds of their conversation with each other. They, and their three spheres, showed no signs of reascending, and it was clear that those three globes and their occupants had been deputed to guard the immediate mouth of the shaft while the hundred others patrolled watchfully all the country around it.

Theories and Conjectures

DARRELL and I, crouching there, saw thus that we had no chance whatever of escaping from our present position. For even there in the darkness, in the dense jungle, we were forced to crouch lower to the earth every few minutes or so as one of the white beams from the circling spheres above and about us would cut down through the night and through the jungle about us. It would be impossible, we knew, to attempt to win free by crawling back through that jungle, since across it there lay here and there other clearings in which would be no shelter from the searching beams and blasting yellow rays of the spheres. Also, neither Darrell nor I would have left then the great shaft itself, down into which we had seen our two friends taken.

So, hidden there, we watched, still somewhat dazed by the thing that had befallen us, the great creatures in the clearing before us. They had turned from the shaft, and were examining the spectrographs and electrical apparatus at the clearing's tip which had been used by Kelsall and Fenton on the appearance of the fourth light-shaft. All of this apparatus they brought back to the shaft's mouth, and then glimpsing the cameras and flouroscopes lying a little out in the clearing from Darrell and myself, were dragging themselves toward these also. We melted farther back into the dense growths as they came near, saw them gather up that apparatus also and carry it back to the great shaft's edge, never suspecting our presence there in the growths so near them. Then, after examining our tent and equipment by the river's edge, they seemed satisfied for the time, and settled themselves heavily about their spheres, conversing in their whistling speech-sounds.

Now too the brilliant constellations far above seemed fading a little as there welled up eastward the gray light of dawn, spreading a pallor over all the heavens. Flushing to rose, and then to crimson with the uprush of the red tropical sun, the skies overhead marked the coming of day, and as Darrell and I glimpsed now the dark metal spheres of the flesh-creatures circling hummingly still overhead, we saw that their searching white beams of light had been snapped out. In the clearing there lounged still, though, grouped watchfully enough about their spheres, the score or so of the flesh-monsters visible there, seeming even more grotesque and terrible in appearance in the light of day than they had been by night. And as day shed its light upon them and upon us, as we burrowed deeper into the thick vegetation with the coming of its revealing light, the daze of astounded horror that had been upon us since the first terrific blasting of the shaft and uprush of the spheres seemed to lift for the first time in some portion from our brains.

"Darrell," I whispered, "where in God's name have these things come from? The four light-shafts — this great opening from beneath — the spheres and these things in them—what does it all mean?"

He shook his head. "It's incredible—unbelievable," he said. "But we saw them come up through that shaft they blasted upward—we saw them take Kelsall and Fenton back down — down to their world—"

"But what is that world?" I asked. "It's impossible that these things should have come from some vast space inside our earth—yet what other theory can account for them?"

"God knows, Vance. But it seems as though they might have come from some strange space inside earth, for they can move only with great efforts upon earth as though accustomed to a gravitational power far less than that on the surface."

His reasoning was correct and I could only shake my head as he had done, as stunned and overwhelmed by the utter strangeness of the thing. And as we stared forth into the sunlit clearing at the monsters and spheres about the shaft there, during the slow hours of that morning, that strangeness and that mystery loomed larger and larger in my mind. What and from where were these incredible flesh-creatures before us? Were they indeed from some vast space within the earth? I had heard the possibility of such spaces discussed many times, and always it had been proved by geologists that no such spaces, even if they did exist, could hold any form of life, since with each foot that one penetrated downward into earth its interior heat became greater, more unbearable. And if this were so, as it was so, even in the first few miles which were all that man had ever scratched into earth's surface, terrific and annihilating temperatures must reign at earth's heart.

It had long been known, indeed, that earth's temperature increased approximately a degree for each sixty or seventy feet that one descended, and that meant that at a depth of a few dozen miles all matter must be in a molten condition, flaming with fiery heat. That theory, indeed, was directly borne out by the numberless volcanoes upon earth's surface in past and present, each of which flung up from time to time masses of the molten rock from earth's fiery interior. How, then, could any great space exist in earth's molten interior, how was it possible, (even were such space by some miracle to exist), for life to exist inside it at the tremendous temperatures that reigned there? It was well enough for fancy to conjure up great caverned spaces and

peoples inhabiting them inside earth's great mass, but the undisputable fact of the molten fires made them impossible.

Yet at the same time we had forced upon us the equally undebatable fact that it was from a space or world within earth's mass, that these strange flesh-creatures had risen upon us. And how, in the face of what we knew, could such a space or world exist? And, greater mystery still, if such a great space inside earth existed, it must lie beneath ourselves, since it was straight up from beneath that these creatures had blasted their great shaft. Yet it was not only here that the great light-shaft had appeared, but at three other places located with super-mathematical precision at three spots exactly on earth's equator like this one, all four being equidistant exactly from each other! And what had been the purpose of those four strange columns of light, and why had the fourth only been followed by the blasting of a shaft upward? And, above all, what was the purpose of the flesh-monsters in bursting up to earth's surface in their spheres, in guarding now so watchfully the great shaft that was their passageway?

Tortured Hours

IT seemed to me during the seemingly-endless hours of that day that those questions were making of my mind a mere chaos of wild suggestions and counter-suggestions. The whole strange thing that had occurred, that was occurring, was so utterly alien to the natural course of events, so utterly inexplicable by any natural reasons, that it was only with an effort that I could consider it even in the hope of finding some explanation. And as explanation there was none, I could only give the thing up at last, ceasing my attempts to comprehend, and concentrating my scattered thoughts as well as possible upon the predicament in which we now found ourselves.

That our situation was in truth a desperate one was more and more apparent to us every hour. For as the burning sun slowly traversed its path across the heavens overhead, blazing down upon us and all about us with its full blistering heat, we saw that escape was as remote as ever. The great flesh-monsters in the clearing, whom I had hoped the sun's heat would drive to the shelter of their spheres, seemed quite unaffected by it. It was a thing that puzzled me somewhat, since it seemed to me that creatures from some cavernous and sunless space beneath would needs be almost seared to death by the scorching rays of the equatorial sun, but it was apparent that those rays harmed them not at all. And high overhead the great ring of circling spheres still patrolled watchfully, still hummed here and there in their watch of the country around their great shaft, so that to break from our retreat though for but a moment would be suicide.

Yet suicide it seemed to Darrel and myself to stay in that retreat, as the slow hours of that day dragged past. For we knew that not much longer could we stand this killing combination of heat, hunger and thirst. Our lack of water, indeed, we appeased a little by chewing a twig from time to time, but our hunger was steadily growing and the heat of the blazing sun above was penetrating down to us and making us somewhat dizzy. Once, I remembered, I returned to realization of my surroundings from such a giddiness to find myself standing erect, and would have stumbled into the clearing had not Darrell held me back. Yet the great white monsters there at the shaft's mouth remained there still as watchfully as ever, their cube-containers of the yellow ray always in their grasp or at hand. Once we saw them draw out from their spheres flexible metal tubes which they inserted in the small holes or apertures that seemed in each their mouths, and guessed that they were feeding, were drawing from containers or reservoirs in the spheres some liquid or semi-liquid food.

Save for this incident, though, there was no break in the deadly monotony of the hours, and as after a time that seemed an age we saw the sun settling westward, my tortured state of mind became all but unbearable. It was the fate of Kelsall and Fenton that to Darrell and myself was the most agonizing feature of our situation, the fact that we had no shadow of idea of what our two friends might, even then, be undergoing in some strange hellish world beneath. Numbed, almost, by the agony of that day's hours, we glimpsed the sunset flaming westward, bringing to my mind the sunset of the day before now seemingly removed from us now by the space of a thousand years. And then, as night crept again swiftly across the world, the great ring of scores of circling spheres above had snapped into being again their white stabbing searchlight-beams, keeping still their never-ceasing and enigmatic watch, while the three spheres around the great shaft sent their own beams stabbing forth to bathe all the clearing about them in white light also.

Sunken into a strange torpor of despair there, Darrell and I were roused shortly after the coming of the night by a sudden swift flurry of action in one of the rivers north of us. There had been the swash of some great reptile in its waters and at that sound from one of the circling spheres above a narrow yellow ray had cut down toward the creature, blasting it instantly from existence with a sharp detonation, the spheres above taking no chance whatever of any approaching their shaft. I had seen that yellow beam stabbing downward, had guessed, incidentally, its nature by then, surmising it to be some form of electronic stream shot with intense concentrated power. This, as I was later to learn, was its real nature, the yellow ray being in effect a highly concentrated stream of independent electrons, which were gathered in a special de-atomizing chamber and then shot forth in that concentrated stream with terrific power. It was thus very much similar in some ways to the well-known Coolidge or cathode ray of our own scientists, but being immeasurably more concentrated and forceful had upon all matter it touched an annihilating effect.

Desperate Chance

THE yellow electron-stream, indeed, was of such force as to wreck completely the atomic structures of all matter it touched, by smashing the revolving electrons of that matter's atoms into their central protons or knocking them completely loose from those protons, thus in an instant destroying the matter touched by the ray by transforming it into a comparatively tiny scattered swarm of pro-

tons and loose electrons. It was by means of a similar ray of gigantic size and power, as I had divined even then, that the flesh-monsters had pierced their great shaft upward to earth's surface in a single moment. And as I was later to discover, it was the same ray in an altered form that was used to drive the great spheres at such speed through the air, a projector at the rear of each sphere shooting forth a somewhat less powerful and fan-like ray into the air behind. This weaker and broader ray, invisible because of its weakness, had not enough force or concentration to destroy the air behind it with its broad electron-stream, but shot forth that electron-stream at a great enough speed against the air's atoms to result in a definite push against them, that push being utilized at each moment to send the sphere driving forward, its direction being altered by changing the direction of the rear-projector, while its speed was altered by increasing or decreasing the force of the electron-stream shot backward.

Even in our watch so far Darrell and I had divined some of these facts, but now as I saw the yellow ray stab downward to the north of us it was not they that held my interest most but the thing which the ray's sudden stab downward had in that moment suggested to me. I turned swiftly to Darrell and then in a tense whisper was outlining to him the plan that had suggested itself to me. Mad enough that plan was, but I felt that it held our only chance of action, since well I knew that not another day could we lie in our retreat fighting against the combined influences of the heat and our hunger and thirst and mental agony. So that it was with conviction enough that I told Darrell that the scheme, wild as it was, held our only hope.

"It's our one chance, Darrell," I whispered. "Our one chance to get down that great shaft—to follow Kelsall and Fenton into whatever strange world they've been taken and rescue them, bring them back!"

Darrell slowly nodded. "We'll have to try it, Vance. If we could get free—could warn the world of the coming of these things from beneath and the menace that that coming must mean to the world—we'd do so swiftly enough. But there's no chance for us to get free of this place with all those spheres above, and there is a chance to get down the shaft."

"It's so, Darrell," I said. "And if we can get down there, bring Kelsall and Fenton back with us, we should be able to break through these guarding spheres here then and carry to the world the truth as to what mysteries or menaces lie beneath."

We were silent both for a moment, as a little to the north and above a sphere hummed past with white beam circling, and then Darrell's hand and my own had clasped there in the darkness strongly. Then, half-rising, I began to carry out our risky plan of action. Turning a glance first upon the things in the clearing, I saw that the three spheres rested still around the great shaft, the flesh-monsters grouped still around and partly within those spheres, whose white beams bathed all the clearing. If we were to steal one of those spheres, as we planned now to do, we must get those great creatures away from them, if only for a moment, and to achieve that purpose I moved silently now in the darkness on the ground and in the growths about us.

In a moment my groping fingers had encountered that for which they sought, a long and heavy section of dead limb that lay rotting in the mold beside us. I grasped it tightly, and then Darrell and I were creeping from our place of concealment in the thick brush, were creeping out until we crouched down just at the clearing's edge, our eyes upon the group of spheres and flesh-monsters at its center, around the shaft's mouth. For a moment we waited there with all our nerves taut, waited until the humming spheres that came and went high above seemed for the moment to have passed over and beyond us; and then, half-raising myself for the moment again, I whirled the big length of wood silently around my head and then threw it with all my force toward the river west of us, into which it splashed loudly, that splash seeming tremendous to my strained ears in the comparative silence that had lain over all about us.

Instantly as that loud splash sounded the flash-monsters around the spheres had raised themselves, listening, and then the next moment were hurrying with great, dragging efforts across the clearing toward the river west of it, forsaking the spheres for the moment to investigate the source of that splashing noise, their ray-cubes ready in their grasp. Tensely we watched as they hastened in that direction, and saw that in only one of the spheres, that nearest us, did there seem still to be any of the creatures, those two remaining inside as though to guard their spheres. The remainder of the flesh-creatures, already, were half-way to the river, and Darrell and I saw instantly that to overcome the two creatures whom we could glimpse in the nearest sphere was our single chance, so, silently but as swiftly as possible, we crept out into the clearing and the white light that lay across it, toward that nearest sphere!

The Chance Wins

As we crept out into that white light, our automatics ready now in our grasp, I heard the whistling speech of the creatures that were almost to the river's edge, and prayed that none might turn back toward us, that none of the spheres might hum down over us in those seconds. On toward that nearest sphere we were moving, half-crawling and half-running, keeping out of line with its round open door so that the two creatures inside might not glimpse us. It was the sphere furthest from the creatures at the river-bank, and in the moments that we crept toward it we kept its great round gleaming bulk as well as we could between us and those creatures. Hearts pounding with excitement and suspense, we neared the sphere, and as though to favor our venture the humming spheres that came and went above seemed to have expanded their ring still further or to be hovering over the land around the clearing for that moment rather than over the clearing itself. I could glimpse their flashing white beams high in the darkness to north and south, could glimpse too the unchanging white stars above, and then could hear the whistling speech-sounds of the two flesh-monsters inside the sphere as we crept nearer toward its open door.

Another moment and we were just outside that round door's opening, were peering for a moment

within it. The sphere's interior, we saw, was divided into compartments by square dividing walls within it, and we saw, too, that from the round door a narrow little corridor led across the sphere's mass toward a small control-room on its opposite side, one in which we could glimpse the switches and strange instruments that controlled the great sphere's operation. The door was near the ground, the corridor through the sphere slanting upward somewhat, and it was in this corridor that the two flesh-monsters were standing for the moment, their backs toward us, gazing in the other direction through the transparent wall or window of the control-room to the river-bank where their fellows were now hastening.

Without a sound Darrell and I crept through the door's round opening into the corridor behind the two great creatures, noting that each held in its grasp one of the ray-cubes also. Up the corridor's slanting floor, into the sphere, we moved toward them, and another moment would have seen us directly upon them, but at that instant Darrell's foot slipped upon the upward-slanting floor of the metal-sided corridor, and as he fell the two creatures had whirled instantly toward us! But even as they did so, even as their great single staring eyes saw us and their strange arms flashed up with the ray-cubes in their grasp, we had leaped upon them, and then before they had time to give warning to their fellows with a single whistling cry were grappling with them there in a swift, momentary battle of intense fury!

Darrell sent our yellow ray stabbing upon them. As they hit, the spheres melted abruptly and vanished.

I felt the great mass of the monster with whom I struggled pressing down upon me even in the first moment that I gripped it, felt its thick strange arms reaching to grip me, or to bring the metal cube of the yellow ray into play. But the creature seemed capable of moving each big arm or limb only with an effort, and before it could crash me down to the floor I had raised the pistol in my hand, had pressed its muzzle in a single instant upon the thing's white flesh-mass just between the great staring eye and the horizontal row of holes that was the mouth, and then as I pressed the trigger there was a muffled report and the great mass before me tumbled downward, carrying me to the corridor's floor with it. I sprang up, though, to find the other monster had borne Darrell against the wall with all its great weight, but then at the same moment as mine Darrell's pistol had come up against the creature's body and as two muffled reports sounded simultaneously from our weapons it too fell. But this one, in the instant before it fell, had given vent to a great high whistling cry!

Instantly that cry was answered by other cries from the mass of flesh-monsters at the river's edge, and as we thrust the two lifeless creatures before us out of the sphere, we saw those others rushing madly across the clearing toward us! I shouted hoarsely to Darrell at that sight, sprang down the sphere's little corridor into the control-room at its end, cast for a moment an agonized glance around that little room. The whole curving front of it was one great transparent window, through which I could see the flesh-monsters hobbling themselves toward us with all the power of their unwieldy, dragging bodies. They had not loosed upon us the rays of the cubes they carried, thinking, no doubt, that in the sphere were still their two fellows, and now as they came across the clearing with clumsy haste I surveyed swiftly the controls of the sphere that lay before me.

The main feature of those controls seemed to be a row of metal studs set into a low panel, in front of which there rose from the floor two low metal standards upon the top of each of which was set horizontally a small metal wheel. In an instant I had grasped these wheels, was turning them, twisting them, but there came no response from the great sphere's mechanism and in another moment the flesh-creatures outside, I knew, would reach us! I heard Darrell shout something to me, reached forward then in desperation and began snapping out the studs in the panel, one after another, and then as I tried the centermost of those studs there came suddenly a welcome and powerful humming from somewhere in the sphere beneath us. But outside now there were whistling cries, as the flesh-monsters rushed over the last few yards of the clearing toward our sphere's door, and I heard Darrell's gun cracking as he strove to hold them back. For an instant they fell back before his fire, but then, seeing through the door that the sphere held none of

their fellows, they were raising their deadly cubes toward us!

At the moment that the cubes came up in their grasp, though, my hands had flashed back to the two wheels, turning them again, and as the first of them turned beneath my hands the great bulk of our humming sphere jerked suddenly up and forward, up and forward over the great black mouth of the mighty shaft! Hanging above its black depths in that moment I heard cries from the flesh-creatures below, glimpsed them running suddenly toward their two other spheres at the shaft's edge, heard the clang of our own sphere's round door as Darrell slammed it shut. Then the next moment I had whirled over the central wheel, and then even as from the running flesh-creatures a dozen yellow beams stabbed toward us, our great sphere had plunged suddenly downward! Downward into the blackness of that shaft, at the sphere's full speed, downward toward whatever mighty mystery or menace it was that lay below!

CHAPTER IV

Down the Shaft

IN that first moment, as we flashed down at such speed into the great shaft's darkness, all my efforts were bent upon the single object of keeping our down-plunging sphere from crashing into the shaft's sides. The white beams of light that stabbed from our sphere were the one guide to me in that moment, the one means of judging our distance from the shaft's sides. Those sides, as seen in our beams' light, were but a swift blur of matter to our eyes, for at the awful speed with which our sphere was whirling downward nothing more of them was to be seen. And as I hunched there over the twin control-wheels, whose use I had half-learned and half-divined in those first awful moment's of the great sphere's rush, it seemed impossible that ever, unused as I was to its operation, I could keep our round vehicle from crashing against the walls of the great well into which we were plunging.

Gripping those wheels, though, having found that one was to control the direction of the sphere's motion and the other its speed, I strove to keep our great globe rushing straight downward. In another moment I found that one of the myriad strange instruments placed above the panel of studs was in the nature of a flight-level indicator, and found that by keeping the red dot that moved along this instrument's graduated length exactly at its center, I was keeping the sphere falling exactly downward. With this discovery I breathed a little easier, then suddenly stiffened again as Darrell, who was crouching beside me, gave a sudden startled cry. He was pointing upward, through the upper portion of our curving control-room window.

"Above us, Vance!" he was crying. "Two spheres—they're pursuing us down the shaft!"

I felt for an instant an extreme terror as I gazed up. For there in the darkness of the shaft above us, that awful darkness that seemed to hem us in on all sides and down into which at terrific speed we were falling, there were stabbing and circling beams of white light like those from our own sphere. I remembered my last glimpse of the flesh-creatures running toward the other two spheres, now I understood that without waiting to give the alarm to the great patrol overhead, they had rushed down after us to destroy us here in the great shaft!

Instantly I whirled again the speed-wheel and as the humming beneath us waxed suddenly deeper our great sphere shot ahead faster and faster. It seemed straining beyond its normal speed in its wild rush straight toward the center of the earth. But above the white beams were dropping nearer to us, overtaking us, operated as they were by the flesh-creatures who understood them far better than I. They had means of increasing the speed that I was unaware of. For minutes we rushed down, pursuers and pursued plunging at a speed that was slowly causing the sphere to become hotter and hotter. Down into and through darkness unimaginable. Then as they drew steadily closer, the two spheres suddenly shot two narrow yellow rays stabbing down toward us!

"The yellow rays!" I cried hoarsely to Darrell, as I swerved our down-rushing sphere almost to the great shaft's side to evade them. "The rays—they mean to get us with the rays!"

"Not if we can strike back at them!" he shouted. "If I could find the control of our own sphere's rays—could fight them back——!"

He was examining frantically the myriad strange instruments and switch-batteries that were set in the little control-room's sides. In another instant, their rays were shot down toward us again, their white light-beams holding us in their glare now. But with another wild swerve of the sphere I managed to escape those twin shafts of destruction. That time, though, I had almost crashed the sphere into the other up-rushing wall of the great shaft, I knew that not for many moments could we continue to escape them thus.

Then came another shout from Darrell, and I turned to see that he had gripped a strange control set beside the control-room's window, a metal globe that was a tiny replica of our great rushing globe, with small studs set at six equi-distant points on its spherical surface.

Darrell pressed upon the stud at the little sphere's top, and as he did so there stabbed suddenly upward from the top of our own sphere a brilliant yellow beam that leaped upward and just between our two pursuers overhead! For an instant they seemed daunted by that unexpected shaft, fell back above us a little, but in the next instant they were plunging down again with renewed speed, their own yellow beams clashing and crossing there in the shaft with ours!

The Pursuers Caught

I THINK that never could there have been combat so wild and strange as that, that terrific duel between three great spheres rushing down into the darkness and mystery of the great shaft, into the depths of the earth. I heard Darrell's hoarse exclamations as he sent our own rays stabbing up toward our pursuers, heard even above the great humming of the spheres and the rush of winds about us the dull and distant detonations caused by the rays striking the great shaft's walls here and there. Whirling our plunging sphere precariously to this side and that, grazing the shaft's walls in wild efforts to escape the yellow rays that stabbed down about us, I realized that the two pursuing

spheres above were drawing closer and closer, would soon be just over us and able to loose their rays upon us without a chance of our escaping them.

I saw that in one last desperate expedient lay our only hope of escape, and above the wild melange of sound about me I cried a few brief words to Darrell. He nodded swiftly as he understood my plan. Then the next moment, gripping the control wheels tightly, I waited for a breathless instant, then suddenly closed the speed-control, whirling its wheel around and slackening the downward speed of our great sphere with breath-taking swiftness. So swift and unexpected was that slowing of ours that, even as I had hoped, the two spheres above had driven down on either side and past us before they could comprehend our action, could slow their own spheres also. And in the next moment as we hung for a moment above them, Darrell had sent our yellow ray stabbing down upon them, striking both spheres squarely.

For a moment they seemed to hesitate and as the brilliant yellow beam of death struck them, both seemed to melt abruptly and vanish! Then came the sharp detonations, caused by the surrounding air rushing into the vacuum left by the sphere's annihilation.

We were alone in the darkness of the great shaft, moving downward now at slow speed as we relaxed, half disbelieving in our escape from those two relentless enemies. The only sound now was the humming of our own sphere, and as we looked up and downward we saw that the only light in the great shaft was that of our own sphere's white beams, circling slowly about as our globe of metal moved downward.

"We got both spheres!" Darrell exclaimed, leaning wearily against the wall. "We've won through so far, Vance!"

"Yes, and no more will be after us from above," I said, glancing upward, "for the flesh-creatures had no time to give the alarm to the other scores of spheres watching above—rushed down after us to destroy us themselves."

"We've escaped them, at least," Darrell said, "and have a clear way downward. But what lies beneath?"

I shook my head. "We must be many miles down the shaft already," I said, "but there's no change that I can see, in the shaft's size or darkness. We must simply keep on, Darrell."

I opened again the speed-control and as our sphere shot downward once more, falling smoothly now again into the great shaft's dark depths, we watched carefully the few details of its walls that were visible in the light of the white beams. Minutes before, during our wild running fight downward with the two spheres, we had flashed past and beneath the levels of limestone and sandstone and all the upper strata, and as far as we could make out in the uncertain vision of our downward rush, we were now falling between walls of igneous or fire-formed rock, the great shaft's opening having been pierced smoothly and vertically up through them.

Down—down—down—the shaft seemed endless to me as I gazed into the darkness unfathomable that lay beneath us, a darkness in which the beams of our sphere seemed overwhelmed. We were humming downward at a speed that was as great almost as that of our first downward rush, and as the moments sped past I knew that we must be sinking farther and farther beneath the surface of earth each moment, yet still the darkness and the curving walls of the great shaft about us were the same. Intent upon the darkness below, in the hope of glimpsing something in that darkness, neither Darrell nor I noticed until moments later a thing which had been thrusting itself upon us increasingly with each moment. And that was the fact that the sphere, and the air inside it, were growing steadily hotter.

A New Danger

As our minds took in that fact we exchanged sudden wide-eyed glances. Did this increasing heat about us, then, betoken the correctness of the theory of geologists that beneath its solid crust lay only fiery molten rock? I remembered the doubts and wonders that had held me formerly, and they deepened within me now as the air about us became more and more heated. Already we were breathing with some difficulty that parching air, and already the metal of the sphere about us seemed to have become almost too hot to touch. And now as we gazed downward we saw that in the darkness beneath a strange feeble glow of light was visible, a flickering, hardly visible sulphurous light that was becoming slowly stronger.

Down—down—already, I knew, we must be hundreds of miles beneath earth's surface. And as the sulphurous glow beneath us grew in intensity, as the heat about us became stronger and stronger, it seemed that our sphere must needs be falling at that awful speed straight to a fiery death. Yet the great shaft's walls fell still vertically downward, and though now those walls of rock seemed themselves touched by a light fiery glow like that beneath, seemed glowing themselves with their own great heat, I held the sphere's course straight downward with Darrell beside me gripping my arm. And now there could be no doubt that the walls about us were glowing, were radiating their own intense heat and light, and I held the sphere as exactly as possible to the shaft's center as we fell on downward, away from those glowing walls of rock.

Within moments the glow of those walls about and beneath us had become intense, terrible, and we could see that they were of solid rock no longer but of glowing, half-melting, half-fusing rock, becoming less and less solid. We could glimpse flashing portions of those walls flowing and moving slowly in thick, molten currents, their fierce light strong upon us now. It was as though we were falling now down through the center of a fiery hell. The terrific heat that radiated from those walls seeming to wither us as we crouched there!

By then the metal of the sphere had become almost burning to the touch, the air within it all but stifling, and as we choked and panted as that superheated air reached our lungs, I knew that to brush even against the molten walls through which we were falling would be to annihilate our sphere in their searing heat. Not for long, I knew, could we reel downward thus through this inferno of heat and light. And now over our sphere's humming

there was coming now to our ears a tremendous grinding and thunderous roaring from all the molten walls about us, and it seemed incredible in that our great shaft could drop downward through them thus, that they had not flowed in upon that shaft and closed it.

"We can't go on," Darrell gasped, his face flushed, his eyes rolling wildly. "This is unbearable."

I agreed weakly. I felt as though I could stand it for only a few minutes more. Then I should lose control of myself utterly. To those of you who have never been compelled to stand insufferable heat for any length of time it is hard to imagine our condition. My blood pounded terribly through my body, its throb hammering at my brain like hammers.

"No one can stand this," Darrell gasped, "Our last moment has come."

It was true. We were reaching our end. But then a sudden thought flashed through my tortured brain. How did those fleshy monsters stand it? They, too, must have been affected by this terrible ever-growing heat. Even with their experience with it they must have some means to protect themselves against a furnace in which no living thing could exist.

I told Darrell my thought. His head jerked up suddenly.

"Yes, that must be so. But how?"

"The controls," I said, "try them. There must be one to handle it."

And as I slackened the speed so that we were jerked against the floor of the sphere Darrell with his last strength fingered the other strange controls that lined the panels, trying this one and that. There was one set like a knob that caught his attention. It was on a wall and apparently had no relation to the others.

"I don't know what we're doing," he laughed weakly, "I may be plunging us to destruction with this."

"It's destruction anyway," I murmured. "Do anything, anything but get us from this unbearable heat."

I saw him turn the knob clear around through 90 degrees. And of a sudden there came a loud sputtering and whistling as of air being suddenly swirled. It seemed as though a tornado had broken loose outside our car. I had to use all my energy to keep the car on its path. But what to my utter surprise and relief when in a few seconds the air was becoming gradually cooler, the walls which had begun to take on a reddish glow go dark again. I saw Darrell smile at me weakly and then slump to the floor in a dead faint. I could not help him for in that tornado that raged in the shaft the car was being swirled about, every so often coming dangerously close to the still molten walls.

It was this condition that attracted my attention. Although the air was becoming cooler and cooler the walls of the shaft were just as hot. These people then had some strange means to get a local refrigeration; and the violent displacement of the air was caused by the cooled air about our car giving way to the more heated.

In a few minutes the atmosphere of the car had become bearable again and in fact it was steadily growing cold. Slowing up the car I reached over and letting go of the control wheel for a moment I flipped back halfway the knob that Darrell had turned. The air became slightly warmer and the raging of the driven air outside subsided somewhat.

Darrell gradually came back to consciousness as we plunged down again. He slowly rose to his feet and gazed about him unsteadily.

"We're saved again," he smiled. "And what now?"

What now? That was the question in my own mind. Where was this endless race to lead us?

And then as if in answer to my question, there was a sudden gathering, an increasing of the thunderous sound and fierce light and searing heat about us, we seemed for an instant to be whirling down into solid flames about and beneath us. Then, as in a flash, a great circular opening in the walls of fiery light had appeared directly beneath us, and as our sphere fell downward still at its tremendous speed we had shot suddenly into open space, into a vast, apparently empty space.

"Through!" Darrell was crying as we shot downward now with the shaft's opening and the molten walls above us. "We've got through!"

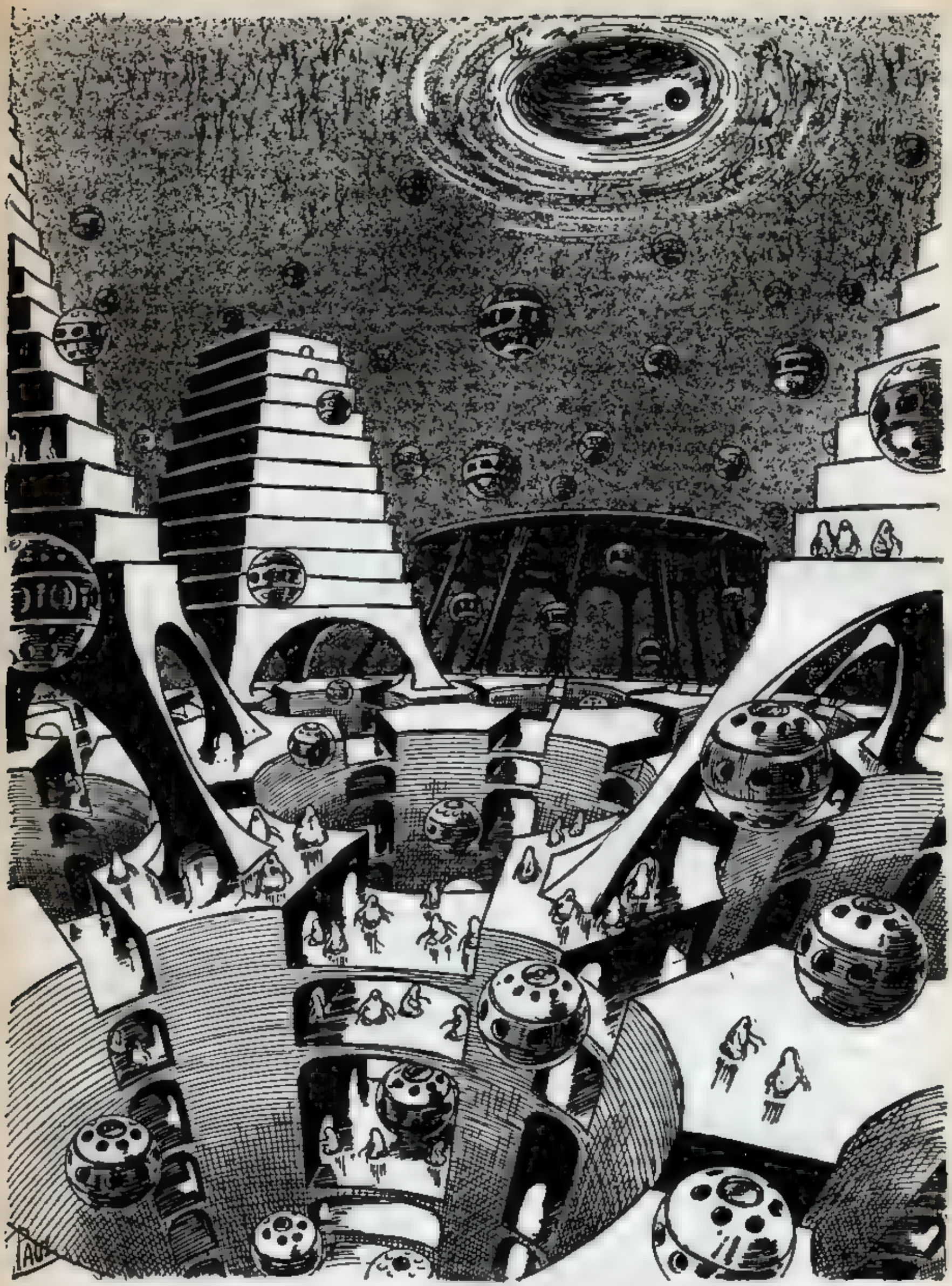
"Through!" I repeated, unconsciously bringing our falling sphere now to a halt there. "Through —but into what?"

The Hidden World

FOR now, as we hung there in our sphere, our first wild moment of exultation over, Darrell and I were gazing out from our sphere's window with an amazement, an utter astonishment, that each moment deepened within us. For the space that stretched now about and below us was vast, gigantic! Just above us there was stretched over our heads, like a vast glowing roof, a titanic, far-stretching surface of glowing molten rock, a great molten sea of intense heat and light from horizon to horizon, literally, hanging above our heads like a strange sky of flowing flame! We could see slow, vast currents in that molten roof above us, could see also in it a round dark opening just above us, the opening of the shaft down which we had come, the shaft that led up to earth's surface!

And now as our eyes followed the giant curve of that fiery roof overhead, we saw that it marched away to right and left, all about us, like a great dome above us, like the dome of earth's own sky, but seemingly a sky of glowing fire and curving downward far from us on all sides, too, curving downward so far away that hardly could we glimpse it. Thus the earth was really a gigantic hollow shell that enclosed within itself a vast space that to our stunned eyes seemed immeasurable, almost! And it was *inside* this great shell that our sphere hung now.

We were within earth's shell! And that shell of a thickness of not more than a thousand miles even as men had found, grew in temperature with each mile of its depth, so that its *inner* surface was almost completely molten, a giant sea of molten rock clinging to the inner surface of earth's shell as unalterably as earth's seas cling to its outer shell, because the center of gravity of the giant shell lay somewhere within its own thickness! And that was why, I knew even in that stunned moment, that the



It was a city in which level was built upon level, numberless strata of streets and structures lying over each other, their transparency allowing the light and heat to penetrate to the lowest level.

molten sea of the giant roof that curved above us and beneath and all about us, did not fall upon us, since it could not do so any more than earth's seas can all fall outward into space. But the greatest wonder was to come. For of a sudden we saw below us as though suspended in the hollow of the great shell a great sphere.

A world! A world at which Darrell and I gazed dazedly in that moment, a great spherical world that was half the diameter of this great hollow space, and that hung beneath us at that giant space's center, motionless there but turning! A great world here *inside* our own world's shell, warmed and lit by the never-ceasing glowing light and heat from all the molten inner surface that enclosed the space in which it hung! A hidden world from which, I knew even at that moment, the flesh-creatures had come.

"A world!" my exclamation was stunned, awed. "A world hidden here at earth's heart, and never dreamed of by earth's peoples!"

Darrell's voice was as hushed with awe as my own. "A world in this great space inside our own world! And turning even as earth is turning, Vance!"

And now too as we gazed tensely down we could make out more features of its gleaming surface, could see that that surface was covered with vaguely-glimpsed structures that silhouetted in the light of the encircling molten shell. We could make out, too, the great outlines of some colossal greater structure on that world's surface almost directly beneath us, and could glimpse even from our height swarms of swift shapes driving to and fro above this strange world's surface!

I pointed eagerly down toward them. "Those spheres, Darrell!" I exclaimed. "Those gleaming buildings—it means that this is the flesh-creatures' world—that it is down to this world that they took Kelsall and Fenton!"

The Transparent City

DARRELL nodded, his eyes alight. "They're down here somewhere, if they're still living. But have we any chance to get to them, Vance, to get them clear and get back up the shaft?"

"We must try," I said. "In this sphere we can at least move about over the surface of this world without the flesh-creatures suspecting our presence. And if we can find some trace of Kelsall and Fenton, can get to them, we should be able to get back to the shaft."

"It's the one chance given to us," Darrell agreed. "And we must win through, Vance, must get Kelsall and Fenton back up to earth's surface, warn the people of earth of what lies here beneath them. Those buildings—those swarming spheres—they show the numbers and the power of these flesh-things, and already they have this shaft that will allow them to pour up onto our earth!"

I nodded grimly, gripping the control wheels once more, and then as I turned them our great sphere was falling again, humming straight down toward the great turning world beneath us. Crouching together there at the low controls, Darrell and I gazed down toward that world as our sphere shot downward. Above us now the great molten glowing roof of this vast space, the inner molten side of earth's shell that enclosed it, was receding. It was only now, gazing out to either side and downward as we fell that Darrell and I were able to appreciate to the full the vast size of this great hollow at earth's heart, this colossal space enclosed by earth's great shell. For to us it seemed that we were falling through open space, a space bounded in all directions not by blue sky but by a great glowing, curving roof.

Within moments we had fallen so near to it that the turning world seemed to fill all space beneath us, shutting from view the other curving molten inner side of earth's shell that stretched far beneath it. We could see now that this spherical world was covered almost completely with strange gleaming structures, great and rectangular in form and rather flat, mighty structures between which there ran the narrow streets. And those streets gleamed even as did the great structures, in the glow of the molten sky surrounding this world. And as we dropped nearer we saw why they did so, saw that streets and structures alike were transparent! They were built of some transparent metal or alloy that made them seem like giant structures of glass, and as we came closer and closer through the flat transparent roofs and walls we could make out vaguely the swarming masses of great white flesh-monsters and the strange masses of objects and mechanisms that those buildings held!

It was a city in which level was built apparently upon level, numberless strata of streets and structures lying over each other, their transparent roofs and streets and walls allowing the light and heat that beat down upon this world to penetrate to the lowest levels! Here and there we could make out great well-like openings that dropped down through those countless levels, while almost beneath us upon the uppermost level there lay the greatest and strangest structure visible on this strange world's surface. This was a giant black shining disk, quite flat, that was fully five hundred feet in diameter, and beside which there lay a smaller and similar disk but a hundredth of the larger one's diameter. Beside both disks were a row of great transparent buildings or structures, crowded with half-glimpsed mechanisms which seemed in themselves more or less transparent, and with countless flesh-creatures. And this great disk was of the same diameter as the great open shaft through which we had come!

Even as that fact impressed itself upon my brain, however, Darrell cried out suddenly, pointed downward, toward the great swarms of spheres moving to and fro over the world beneath us. We had been humming swiftly down toward those swarming spheres without giving them attention for the moment, engrossed as we were by the astounding spectacle of the strange world. But now, as Darrell shouted, I felt a sudden stab of icy fear. For those swarming spheres had given way to all sides beneath us, for the moment, and up through them there had rushed a close-massed swarm of more than a hundred gathered spheres, a hundred spheres that were whirling swiftly straight up toward ourselves!

CHAPTER V

A World of Wonders

IN that moment as the hundreds of spheres drove up toward us, Darrell and I stared transfixed with horror. I could make no single move to escape them. So sudden and unexpected had been their swift rush upward that I could only watch them as one fascinated. Long before we could turn, could win back up to the shaft's opening, those spheres would be upon us with their blasting yellow rays. In an instant, it seemed, they were beneath us, whirling straight up, and then suddenly they had changed their formation a little, spreading out a little and swerving as they did to one side, and the next moment before I could comprehend what had happened were flashing up *past* us, up toward the molten curving roof far overhead!

"The shaft!" Darrell was exclaiming. "They've gone to the shaft, another hundred spheres—but why?"

"I think I know," I said, as a sudden idea occurred to me. "It must be that this hundred spheres have gone up to relieve the hundred guarding the shaft's mouth—that have been guarding it now for more than a day."

He nodded at my suggestion. "That must be it," he said, "but for the moment it seemed all up with us."

But now we were turning our attention back down toward the great strange world beneath, down toward which we were still dropping in our humming sphere. I gradually decreased the speed of our sphere until moments later, when we shot down among the swarms of spheres that came and went above the transparent streets and structures of this world, we were moving at a moderate speed. All about us now those spheres were swarming, and through their control-sections' windows we could glimpse the great white flesh-monsters inside them, at their controls. We took care to crouch as low as possible at the controls of our own great globe, and constantly moving as we were there seemed small possibility that any of the creatures in the flying spheres about us would notice our strange appearance, would recognize us as different from themselves.

As we shot among them, though, Darrell and I were surveying with intense interest still the features of the world beneath. A great and unending mass of gleaming, transparent structures and streets it lay reflecting the glow of the molten inner shell. The streets beneath us were swarming with masses of the great flesh-monsters, and as we saw their great forms hurrying to-and fro, with a speed far greater than that of their clumsy movements on earth's surface, we realized that it was the smaller gravitational attraction of this smaller world, apparently, that accounted for the clumsiness and greater weight upon earth's surface.

Darrell was clutching my arm now as we sped on across this strange, teeming world. "What about Kelsall and Fenton?" he said, "how are we ever to find them here?"

I shook my head. "It seems impossible," I admitted, "but we must try."

He was viewing keenly the swarming scene beneath us as we shot on. "I think, Vance," he said, "that if Kelsall and Fenton are still living, are being held here by these flesh-things, it would be in one of the lower levels, if only for safety's sake."

"But we can't explore the lower levels!" I pointed out. "Even here in the sphere above this world we may be discovered any moment, and to leave it and venture down there inside on foot would be suicide!"

"But there's another way we can try," Darrell said swiftly. "In the sphere we can get to those wells that sink down through the different levels—and perhaps get some clue as to their whereabouts."

I realized that the plan Darrell suggested to penetrate down into the strange under-levels of this strange hidden world was in fact to find our two friends. So, nodding quick agreement to his suggestion, I sent the sphere heading across the great transparent mass of structures and swarming streets, through the crowds of spheres that flashed to and fro above it, until there appeared ahead a great circular opening. It was one of the great wells that we had seen from above, a great shaft that sank down through the various transparent levels of this mighty world-city. And as we neared it we saw that down into it and up from it were pouring a ceaseless stream of great spheres like our own. A moment more and we were among them, were hanging over the great well's depths. As I turned the control wheels our sphere began to sink downward.

A moment more and we had sunk beneath the topmost level, and then, beside us, there stretched away the equally vast and swarming scene of the second level. A full hundred feet or more in height it was, from its floor to the transparent streets and structures of the first level above it which formed its roof, and down through that roof there beat almost unabated the glowing light and heat that fell upon this world! In this second level, though, were no structures such as rose upon the first, for being completely under cover as it was it formed in effect but one gigantic room which stretched like the levels beneath and above it completely around this turning world!

And it was a scene of strange activity that rivalled that of the top level. And as we could gaze far across that second level, we all but forgot the object of our quest in the unparalleled interest of the scene. For about us there stretched on that level such a great melange of mighty mechanisms and busy flesh-things, such a babel of clanking and humming of machines and whistling of strange speech-sounds, that almost were we stunned by it. And as we hung there, gazing from our sphere in fascination while other spheres from above and beneath us in the great well sped into this level or sped out of it, we could make out dimly the purpose of some of the great mechanisms we saw before us, could half-comprehend the true wonders on which our eyes rested.

Near us on that level was one of the mightiest of the great mechanisms, a tremendous squat cylindrical affair constructed for the most part of transparent metal, for the purpose of impeding as little as possible, like all the other mechanisms and structures in this world, the light and heat that fell to the lower levels. We could see that a great chain-

lift contrivance rose just beside it, an endless chain upon each few feet of which were great shallow cups or scoops filled with broken rock, rising up through the levels beneath by means of round openings in their floors. These masses of broken rock were automatically dumped into the uppermost section of the great transparent cylinder, where there played upon them from all sides a lambent green light of force that was conveyed to the cylinder by thick cable connections. Beneath this green force the masses of rock were disintegrated instantly into a fine dust, and as much swirled down into the second section of the cylinder.

This section was divided into several transparent compartments, in each of which there played an unceasing yellow ray like the electron-stream ray used by the flesh-monsters to annihilate matter. As the fine rock-dust entered these compartments it seemed annihilated instantly, seemed changed to a mere cloud of shining particles rushing down into the third section of the cylinder into similarly divided compartments where another yellow ray played upon each. And beneath this second yellow beam or force those half-glimpsed shining clouds of particles changed back swiftly into visible matter, different in each compartment. In one it became a fine gray powder, in another a milky white liquid, in still another a thin saffron fluid. And these poured down in turn from the vivid compartments into the cylinder's lowest section where they mixed together instantly under the force of powerful vibrators to form a thick dark liquid which was conveyed away by great pipelines of transparent metal to vast tanks visible in the distance.

This great mechanism, humming in unceasing operation, puzzled me for a moment, but then as Darrell and I glimpsed small flexible tubes and nozzles projecting here and there from the pipelines, and flesh-creatures now and then seizing those tubes and inserting their ends in their mouth-apertures, we remembered the same action on the part of the flesh-things above; saw that this dark liquid was their food, and gasped as we realized that the giant cylindrical mechanism before us was one of countless similar mechanisms we could glimpse that were making that food directly from the rock brought up from beneath! For that rock, we saw, was pulverized by the green force, then was treated by the yellow ray to make of it but a miscellaneous collection of protons and electrons, to separate the electrons and protons of each of its atoms, sending those electrons and protons down to the cylinder's third section.

The Secret of Transparency

THERE those electrons and protons were acted upon again in separate compartments by different yellow rays, were built up by those rays into the desired substances by causing to join to each proton the desired number of electrons, thus forming any element desired. And with the desired elements formed thus in each of the compartments, it was needed only to let them mix together in the fourth section of the cylinder, to form into the complex compound that was their synthetic food-substance. This much of the process I could fathom, as did Darrell, from what we could see before us, though we knew that in reality it must be much more complicated than that.

Far across this second level Darrell and I could see scores of great cylinder-mechanisms like the one before us, each served by a chain-lift that brought ceaseless supplies of rock up to it from beneath and each swiftly converting those rock-masses into the dark liquid that flowed away to the great reservoir tanks located here and there. From which tanks, as I could see even then, it was piped away in all directions, carrying the dark synthetic food-liquid by force of gravity down through a great pipe-system to all of this strange world-city's lower levels, the whole countless hordes of the flesh-creatures being able thus at any moment to obtain the necessary amount of the food-liquid from the nearest tube and nozzle.

Across all this second level extended the great cylinder-machine and tanks, humming with activity and swarming with the flesh-things who watched and regulated the operation of the vast machines, but no sign was there that anywhere here were our two friends. So, with a last glance across the level, I sent the sphere downward again in the great well. Spheres were crowding thickly about us still in that well, halting here and there as they reached the level they desired and speeding away inside that level, but all seemed so intent upon their own course that their occupants gave to our own globe no attention. So, when we reached the third great level, a hundred feet farther down, we hung motionless again, Darrell and I gazing with eager eyes through it as through the one above in the hope of glimpsing some trace of our friends.

This third level, though, seemed much like the one above it, a great vista of strange great mechanisms lit by the glow from the transparent level over it. Here, though, that glow of light was perceptibly weaker and here the great mechanisms that were ranged about were of a visibly different nature. For though they were cylindrical in shape and much like those food-making mechanisms on the level above in appearance, it was not the dark food-liquid that these were busy in producing. Instead the electrons and protons that they made of the rock-masses fed into them were formed by successive treatments of the yellow force into white-hot streams of molten metal, which cooled swiftly into great ingots that were conveyed from beneath the great cylinders by moving belts or platforms of metal.

These great new-formed ingots, in turn, were thus transferred to giant automatic presses which in one motion changed them to great flat or curving plates of metal. What interested me most was the next step of the process, in which most of the plates and sections thus formed were carried along by their moving belts and between great tubes from which glowed a green force through which they slowly passed. And as they passed beneath the power of that green force, as it flooded through them, we saw the great sections of metal becoming transparent before our eyes! It was apparent that the green force was one that in some way altered the molecular or crystalline structure of the metal in those sections, making them as transparent as glass itself without impairing in any way their strength.

And as we gazed thus with fascinated eyes at this mighty clanging workshop, there came to me the answer too of another thing that for some time had puzzled both Darrell and myself. For we had, in all the vast swarming scenes that we had passed over and through so far on this strange world, seen none of the flesh-creatures sleeping or even resting. Even the hundred spheres that had patrolled the shaft's mouth on earth far above had been relieved, we guessed, because of the need to replenish the power of their mechanisms rather than to give their occupants a rest. And since there was no night, could be no night, in this hidden world around which on all sides there extended the molten, ever-glowing surface of earth's shell's inner side, why was it that none of the masses of creatures we saw seemed ever to sleep or rest?

But now we saw the answer to that question in a single creature who seemed to be moving slowly among the masses of the other busy flesh-creatures, stopping for a moment at each one. And as he came nearer to where our sphere hung, we saw that he held in his grasp a transparent metal container of some thin bright crimson fluid, and that with an apparatus very much like a long hypodermic needle he was injecting a swift shot of this fluid into each of the busy workers, a little below and to one side of the single great eye. For the moment the thing puzzled me, but then I realized that this was the answer to the sleeplessness of the creatures that this crimson fluid was one that neutralized in their bodies the toxins that caused the need of sleep.

Makers of Flesh!

IT was a world of wonders, surely, into which Darrell and I were penetrating in our sphere, but now after a last glance I shot the sphere down to the level beneath, to gaze along it also for some clue to our friends' whereabouts, a certain hopelessness had begun to fill me, a hopelessness that I expressed to Darrell.

"This immense world-city—these swarming levels—" I said, "it seems hopeless, Darrell, to search for Kelsall and Fenton in them."

"It's our one chance to find them, though," he said, his own brow wrinkled anxiously, "and we may light upon them yet."

"If we only knew where the center of government—the center of activity—of this world was," I said, "we'd have a chance, for if Kelsall and Fenton live they'd be near it. But as it is——"

We were silent both, a tense, almost despairing silence, as we sank down farther in the great well. Tremendous massed machines, hurrying, busy flesh-things, rushing spheres, clang and hum and hiss of sounds, these things stretched far away about us in that level, and in the next beneath it, and the next. Down and down into the great well we sank, hanging beside each level, and gazing across it in vain hopes for some trace of our two friends. And as we sank downward we noted that in each level that we descended the light that filtered down through the transparent levels above was feebler, duskier.

Yet still there swarmed in each level the busy hordes, the ceaselessly operating machines, while from level to level in the well about us shot the rushing spheres. And from level to level up the narrow stairs that led from one to another there moved ceaselessly streams too of great flesh-monsters hastening upon incalculable errands. Like a giant replica of some strange anthill was this unutterably alien world hidden here at the heart of earth's colossal shell, and as we sank downward through its levels in the great well, pausing in our vain search at level after level, gazing across those swarming levels, we could make out vast mechanisms and contrivances some of which were quite incalculable in purpose, others being more or less clear in principle at least to our watching eyes.

We saw what we learned later were giant atom-disintegrating mechanisms which were fed with rock and with broken and worn metal scraps, and which swiftly stripped from the atomic structure of that mass of matter its electrons, separating them from the protons and forcing them into special compression-chambers in which other forces held them prisoned. It was these compression-chambers of prisoned electrons, as we surmised, that were the source of much of this world's power, since when released in special projectors those electrons formed electron-streams or yellow rays such as we were already familiar with and which could be regulated in power. They were used in a concentrated ray to blast matter into annihilation, or released in a broad invisible fan-beam from the rear of the spheres to drive them forward, as we had already guessed during our observation of the creatures above.

Upon a lower level we saw two great chambers or laboratories through whose transparent walls we could make out huge retorts and strange chemical apparatus, vast and complex mixing and separating mechanisms, tended by careful flesh-creatures. The product of those strange laboratories seemed to be a white, pulpy substance that for the moment puzzled us, but that we then recognized as flesh, as white flesh like that of the creatures who were making it! And in transparent-walled chambers beyond we could see their uses of that artificial flesh, those body-tissues which they created, could see them using them to repair the bodies of their own fellows that were mangled now and again in some of the great machines! For to these masters of the atom, these strange beings who had learned to change by super-alchemy any element into any other by the shifting of its atoms' electrons, the creation of these complex flesh-compounds was a matter so simple as to be carried out almost automatically by their great machines!

For a time that seems now to me filled only with a blurred memory of tremendous, incalculable mechanisms and swarming flesh-creatures and rushing spheres, of level beneath swarming level in this strange stratified world, we sank down. I cannot remember, now, all of the strange things of this hidden world. But at last, though, the last few levels lay beneath us, the great well's smooth floor a few hundred feet only below us, and we were sinking down past those last levels with hope fading in us.

Thost lower levels, we found, were in effect a gigantic workshop in which the curved and flat sections of metal manufactured above, were combined with a myriad other objects and instruments

brought from the upper levels by ceaseless chain-lifts, to form countless masses of the great flying spheres. For as Darrell and I gazed out across those lowest levels, we were all but deafened by the terrific clangor of metal that came to our ears. As far as the eye reached nothing was visible but row upon endless row of great spheres, being assembled there by countless hordes of the busy flesh-creatures. Most of the great spheres, indeed, seemed already assembled, already gathered there in great rows and ready for operation, and as Darrell and I saw that we gazed for an instant at each other with startled eyes.

"Almost ready!" I whispered, as we gazed out through that terrific clangor of sound and ceaseless activity. "Almost ready, Darrell—all these countless thousands of spheres!"

A Conference

HE nodded, looking forth with me. "It can only mean that they're almost ready to surge up to earth's surface in their great attack. For they've pierced their shaft up to the surface, and now these numberless spheres in which they can rush up are almost finished."

Something of despair, I think, came upon us as we looked forth upon those tremendous preparations that we knew spelled doom for our own world. It was with that despair deepening in my heart that I sent our sphere rising upward in the great well, since it was plain to Darrell and myself that, wherever our two friends might be, it would not be in these vast workshops of the lowest levels. Abruptly, though, as we rose slowly upward amid the swarming spheres in the great well, there came something that for the moment made us forget the despair that had gripped us. And that was a sound, a great high whistling sound of immense volume and intensity came through all the swarming levels of this strange swarming world. As it sounded a sudden hush seemed to fall upon the activity all about us, all seeming listening to the call, even as ourselves. And as the great call ceased we became aware that though the activities about us had begun again, though the clanging of the great machines in the levels about us had not ceased, a number of the swarming spheres about us and above and below us seemed converging now toward a certain level in the well, toward the sixtieth of this great world's levels, and were disappearing from the well into that level. From all about, from all the other levels and from far across this world's topmost transparent surface above, spheres were rushing in scores in answer to that strange call, though save for them the activities about us were unchanged.

Darrell and I exchanged quick and eager glances of hope, as we saw those spheres disappearing in a great stream into the sixtieth and in a moment, with a last hope that that summons might have some connection with our friends, we were joining that stream of rushing spheres. Between the transparent roof and floor of that level, through a dusky feeble glow of light that beat down through the levels above us, onward we sped with our fellow-globes, in answer to that great summons, over and around the vast mechanisms and hastening workers between colossal floor and roof for mile upon mile, a wild speeding for us through that vast and dusky level.

As we rushed on I was able to see that it was by means of great pillars of transparent metal that the great levels were held each above the other, was able to see that all these levels, all this world, were in effect but one vast gigantic workshop. And a workshop it was whose activity seemed never to cease, the flesh-things tending always their mighty humming and clanking mechanisms, their only pauses being to take from the nearest tube of the great pipe-system their liquid food, or to have injected into them, by the creatures set aside for that purpose, the crimson fatigue-neutralizing fluid. A vast workshop, indeed, and one that I knew was hammering out with each passing hour the doom of my own world.

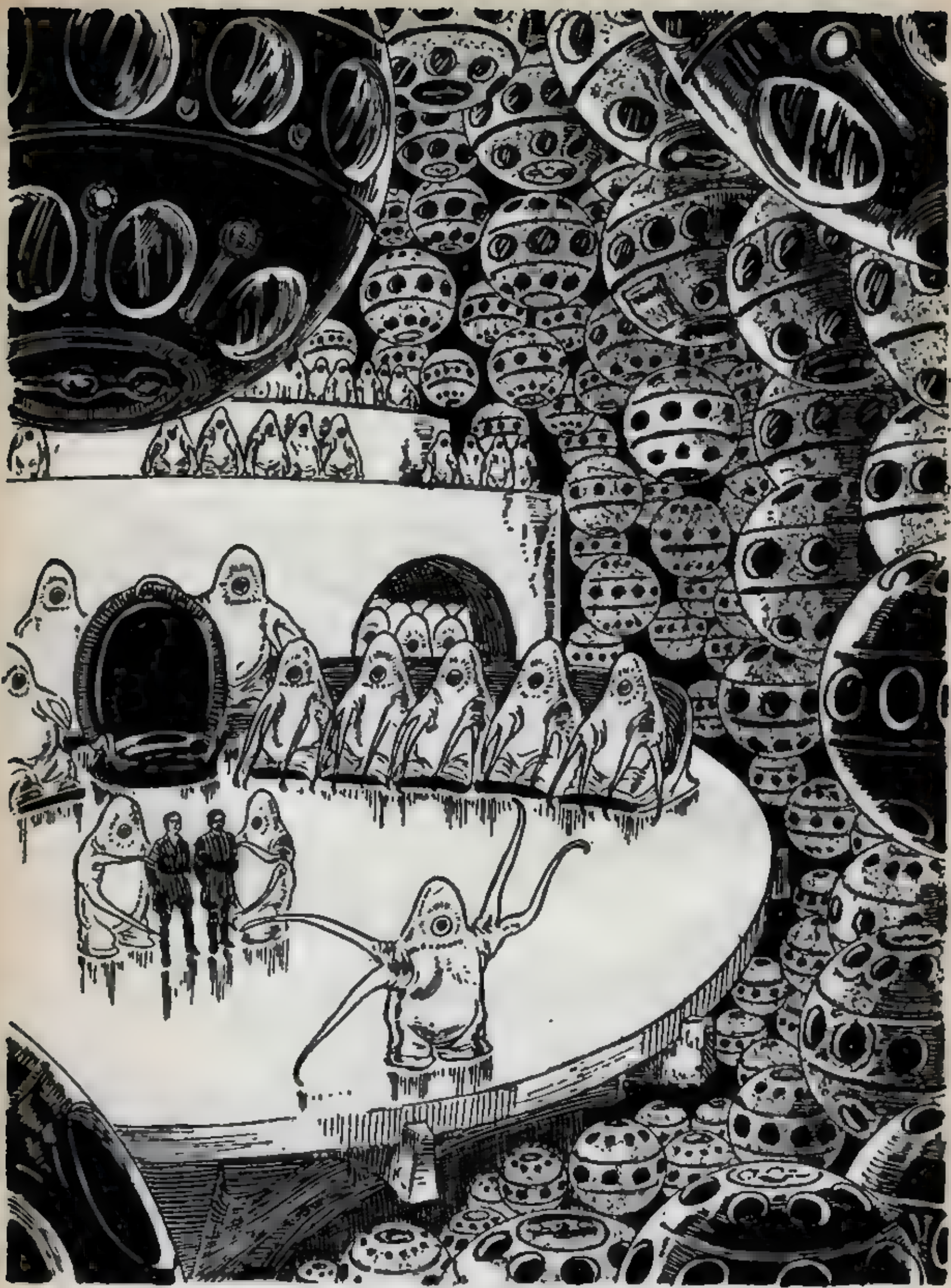
But now rushing stream of spheres about us was slowing, and as we slowed our sphere also, Darrell and I peering forward through its window with eager excitement, we saw that the spheres among which we moved were shooting out now from the level in which we raced into some vast and apparently open space that lay before us. In another moment our own sphere, with those directly above it, was flashing out into that space, and then we saw in that first glance that it was no open space, really, but a vast hall.

Kelsall and Fenton Again

VAST indeed was that hall, a tremendous oval room more than two thousand feet in length, and extending through a dozen levels of this strange world. Beneath us stretched the great hall's smooth floor, and far above its transparent roof. And immense as it was it seemed all but filled now with spheres like our own, hanging motionless in great swarms of hundreds upon hundreds. Within a moment it seemed, the whole titanic hall was all but filled by the countless scores of spheres that had gathered within it.

In each of these spheres about us, we knew, were one or more of the flesh-creatures, summoned to this hall from across all this world by the strange great call. And as Darrell and I gazed eagerly forth to find the purpose of the gathering, we saw for the first time that at one of the ends of the mighty oval room there jutted forth a broad balcony halfway between floor and roof, and that upon this balcony were gathered a row of some twelve great flesh-creatures, seated and regarding the spheres that had gathered here in answer to their summons. So far away were they from us in the vast hall that the great creatures seemed tiny, almost, seen by us through the crowd of spheres that hung about us. And then suddenly a stir of movement, of excitement perhaps, ran through all those massed spheres as one of the twelve seated figures arose and stepped forth to the balcony's edge.

For a moment he seemed to regard the massed spheres before him in silence with his single great staring eye, and then had begun to speak, the whistling sounds coming out to us in the great hall loud and clear, sent forth, no doubt, by some amplifying apparatus. Slowly and deliberately he was speaking, to the massed spheres in the great hall before him, to the flesh-creatures inside those spheres, and though his speech-sounds were of course utterly unintelligible to Darrell and myself, there came to me a dim per-



And then they stepped aside, disclosing to view two figures whom they guarded and on whom they kept a tight hold. Those figures were Kelsall and Fenton!

ception of the nature of the gathering about me. I realized that those twelve creatures on the balcony must form the supreme ruling body of this hidden world, and that the flesh-creatures in the hundreds of spheres about me that had gathered here would be, perhaps, the officials or lesser heads of that world.

And, hanging there, it was as though Darrell and myself had all but understood the creature's strange speech, had understood that he was speaking to the creatures about us concerning the vast work now rushing to completion in this world's levels, the giant plan that these things had formulated to surge up upon our own earth. A strange sense of unreality came to me as we hung there, listening to those whistling speech-sounds, and surely never were men in a more unreal and incredible position than we. Hanging there in our great stolen sphere amid hundreds of similar spheres filled with flesh-creatures who never dreamed of our presence among them! Hanging there in this great hall among the levels of this swarming hidden world that spun here in the vast space at earth's heart! Our situation was so grotesque, so nightmare-like, that as we seemed almost in the midst of some strange dream.

Suddenly, though, we snapped back to realization of our situation as the whistling voice of the great creature on the balcony suddenly ceased. Whatever it was that he had said, whatever orders he had given to the creatures in the spheres about us, we saw another stir of movement run through their masses as he ceased. A moment he paused, then was speaking again to them for a brief moment, turning then to give a short order to someone behind him. Instantly in answer to that order there emerged onto the broad balcony from the door through the wall behind it a half-score of flesh-creatures armed with the ray-cubes, and guarding with them some figure or figures that walked forward among them. They paused, near the great balcony's edge, an intense silence seeming to have fallen for the moment over all the great sphere-crowded hall. And then they stepped aside a little, disclosing to view two figures, whom they guarded, and on whom they kept a tight hold.

And those two figures were Kelsall and Fenton!

CHAPTER VI

The Origin of the Hidden World

IN the next moment, as Darrell and I gazed upon those two tiny, distant figures that had appeared there on the balcony at the great hall's end, my first impulse was to send our sphere flashing across the hall toward them, and with our own rays send their captors to annihilation. But in that moment Darrell's hand was suddenly strong upon my wrist, and though his eyes were as alight with excitement as my own, he was holding back my wild impulse.

"Not now, Vance!" he whispered tensely. "We've found them—but we can't make a move toward them now!"

"Found them—yes!" I said, my heart hammering. "But why have they been brought here—brought before these things?"

"We'll soon see," Darrell said. "Hold steady—and our chance to free them will come."

So throttling that first mad impulse, I waited with Darrell gazing tensely toward the figures of our friends on the great balcony. Their guards, moving back a little from them, now held them face to face with the great flesh-monster who had been speaking to us. And now as he surveyed them for a moment with his great eye we saw them returning his gaze, Kelsall's strong face drawn but steady, Fenton standing beside him with a hand upon his shoulder. We saw them, too, venturing a glance around the great sphere-filled hall, and could see that in their belts were no longer their pistols. Then as Kelsall and Fenton faced the great flesh-monster there, he had begun to speak to them, to speak to them for a moment in the whistling speech-sounds of these things.

A moment only he spoke to them and to the amazement of Darrell and myself, when he had finished, Kelsall replied to him in the same whistling sounds or in a human-voiced imitation of them! Replied to him in a few brief strange-sounding words or phrases in the manner of these flesh-creatures. There was silence for another moment when he had finished and then the creature, suddenly threatening and baleful in aspect, spoke to them again, several minutes in a long, deliberate exhortation of some sort. His whistling sounds, unintelligible to us, were being listened to intently by Kelsall and Fenton as well as by all the creatures in the crowding spheres about us. And when the great monster had finished our two friends replied to him instantly with a single whistling sound, a single phrase or word. And as they did so there rose from all the flesh-things in the gathered spheres about us a sudden babel of whistling cries!

Darrell and I gazed across the hall tensely as that strange and sudden tumult arose, precipitated as it had been by whatever answer Kelsall and Fenton had made to the speech of the great creature before them. His whole attitude in that moment was as eloquent of anger as that of such an alien creature could be. My hands tightened upon the controls in that moment for I looked for the thing to give an instant order for the death of our friends, so fierce and evident was the anger of all about us at whatever response they had made to him. Instead, though, the thing gave only a brief order to their half-score guards and those stepped instantly forward and still holding our friends, marched them back through the great door in the wall from which they had come. And then, as Kelsall and Fenton disappeared with the guards through that door, the standing monster on the balcony had turned back to our gathered spheres and again spoke to them.

Now, though, as we heard his whistling speech, Darrell and I were gripped with a tense impatience, for we wanted only to follow our friends and their guards, yet dared make no move toward that door behind the balcony until the creatures on the balcony were gone. Tensely we waited, knowing that with each moment the guards and our friends would be farther from us.

Then as with a final whistling order the great creature on the balcony ceased speaking, the spheres that filled the hall were beginning to empty out of it. Pretending to join them, I still held our own sphere in the hall, and in a moment more Darrell and I could see the twelve flesh-monsters on the balcony passing back from it through the great door in the wall behind it. In a moment they were gone, and in moments more the last of the great spheres had sped out of the mighty hall except our

own. Instantly then I sent our own sphere driving across the huge room toward the balcony and the great door behind it.

That balcony and door were set in the great room's wall just above the sixtieth level, and in a moment we had reached them, our big sphere still proving small enough to pass easily through the great door. As we shot through it, therefore, we found ourselves within the fifty-ninth level, that level being but feebly and duskily lit by what light came down through the transparent levels above. Before us there stretched away great rows of vast machines like those we had glimpsed from the well, those about us being engaged in turning forth metal ingots which were conveyed automatically to the great presses that shaped them into plates. Swiftly we gazed about us, but for the moment could see nothing of our friends amid all this swarming activity of flesh-creatures and machines of the guards. Then suddenly, as sharp despair seemed upon us once more, Darrell pointed away through great rows of the mechanisms and I made out the forms of the half-score guards, grouped still about our two friends, marching with them down between those two great rows of machines.

Instantly I sent our sphere humming after them, holding it behind them until, at a low speed, we were following them at a distance of a hundred yards or so. As we shot after them, curving now and then around some larger mechanism, we evoked no attention whatever in our sphere from the flesh-creatures busy in countless numbers at the machines around us, since scores of other spheres like our own were darting to and fro within this level upon errands of their own. And now as we followed our friends and their guards across the dusky-lit level, swarming with clanging activity, we became aware that ahead the great mechanisms were coming to an end, their long rows giving place to series of transparent-walled rooms of metal constructed in rows or blocks. Down a broad avenue between two such long rows of transparent-walled rooms the guards were moving with our two friends and slowly, dropping to a greater distance behind, our big sphere followed them, our hearts beating high now.

Most of the rooms on either side of us, we saw, as we sped between them, were storerooms of various materials which were apparently too valuable to be allowed to lie loosely about. Some of the rooms held masses of shining ores strange to us, some intricate mechanisms whose purposes we could not even guess, others stores of what seemed projectors of the yellow ray. In none of them, though, were there any of the flesh-creatures, and as we moved on there far behind the guards and our two friends, we became aware that the clangor and hum of sound from the great machines behind was becoming fainter and fainter and that in these blocks of store-rooms and avenues into which we were moving there seemed hardly any flesh-creatures visible. Then as the guards around Kelsall and Fenton, far ahead of us, turned suddenly into an avenue leading to the left, they vanished from our view.

By the time that our own sphere had reached that turn, had halted a little short of it, we could see along this dusky branching corridor that the guards had halted Kelsall and Fenton for a moment at the door of a transparent-walled room, were opening that door. This branching corridor was too narrow for our big sphere to enter, and now as we hovered in the sphere there in that moment we saw the guards opening the door, thrusting our two friends inside, and then closing it sharply after them, tampering for a moment after with some device upon its surface. Then they had turned from the door, and two of the flesh-creatures having posted themselves before it, ray-cubes in their grasp, the remaining eight were coming back toward the main avenue, toward ourselves.

At once I darted our sphere backward, and as they emerged into the main avenue sent the sphere rising swiftly upward in that avenue. The avenue, like the rooms on either side of it, extended clear to the roof of the fifty-ninth level, a hundred feet above, and in a moment our great sphere had hummed upward and the eight guards, unconscious of our presence above them, were passing back along the avenue beneath us, toward the great oval hall. A moment more and they were lost to view down the dusky avenue, and then I brought the sphere down to the floor again, to where the narrower corridor branched from the avenue. Keeping well back from that corridor and out of sight of the two guards posted in it, Darrell and I gazed for a moment ahead and behind, seeing that about us were none of the flesh-creatures in this quiet section of store-rooms. Then we had turned toward each other.

"Now is our chance!" Darrell whispered. "If we can overpower those two guards and get Kelsall and Fenton out of that cell and into our sphere, we'll be able to make our way back up out of this world, up the shaft to earth's surface!"

"We still have our pistols," I said, "and with them we should be able to dispose of these two guards, at least."

"Yes, but no noise if it can be helped, Vance," he cautioned. "A shot is liable to bring a swarm of the creatures here upon us, and wreck all our chances."

Having seen to the magazines of our two automatics, we turned toward the round door of our sphere, swung it quietly open. As I crouched there inside it it came to me, strangly enough in that moment, that in all the hours since Darrell and I had entered that sphere in our mad rush into it at the great shaft's mouth, far above on earth's surface, we had not left it. Now, though, stooping a little at the round door, I tok a quick step onto the great avenue's translucent floor, through which we could glimpse vaguely the swarming machines and creatures on the level far beneath. And then as I took that step, emerged from the sphere, I found myself rocketing smoothly upward toward the great level's roof!

In that instant, that moment in which I went smoothly up to the avenue's roof like one falling upward, such fear gripped at my heart as I had never known before. I heard a hoarse whisper from Darrell, below, and then as he stepped out from the sphere he was falling smoothly upward with me, until in a moment our heads had bumped gently in succession against the roof of the level, and then we were falling as smoothly and gently downward, lighting like falling feathers upon the

avenue's floor! Crouching upon that floor, far back in the avenue from the corridor of the two guards and our friends' cell, we lay for a moment with hearts pounding, finding now that each slight stir of our muscles as we crouched there caused us to float up for a yard or more from the floor on which we lay!

Then abruptly light came to me and I clutched at Darrell's arm. "The gravity, Darrell!" I whispered. "The lesser gravitational power of this world! You remember how the flesh-creatures could hardly move on our own world's surface? And it's the same with us, only reversed!"

I saw comprehension in his eyes instantly, saw that he understood, as I had suddenly understood, that it was the smaller gravitational power of this smaller world that gave each effort of our muscles such enhanced effects. Crouching in our sphere, holding to the controls and moving constantly to and fro, as we had done in our hours inside this world so far, we had not noticed this, but immediately upon emerging from the sphere and using our muscles it had become apparent to us in this startling fashion. Now, though, we strove to find some method of locomotion that was to allow us to move slowly forward along the avenue. After a few moments' experimentation we found that by lying flat and crawling slowly forward as a swimmer might crawl upon a pool's bottom, we could progress forward at fair speed and in silence. We crept down the avenue toward the narrow corridor that branched to the left from it, and in which were stationed outside the cell of our friends the two guards.

The Battle in the Corridor

IN a moment we had reached that corridor, and then, just back from it in the main avenue, we peered cautiously down it toward the two great flesh-monsters standing still at the door of our friends' cell. Through the dim dusk that reigned here in this level we could make out vaguely their great white shapes, standing outside that door with their ray-cubes watchfully in their grasp. A moment we peered toward them, our own automatics in our hands now and our eyes gleaming as the moment for action approached. Then I turned to Darrell for a last word with him before we leaped upon the two guards. And in that moment, as I turned, there came a thing which so astounded us as to leave us for the moment incapable of action.

There was a violent rocking and swaying of the floor beneath us, of all the mighty levels, the levels above levels about us, and as this whole strange world seemed to rock and quake thus about us there came a distant, thunderous booming detonation that awful, grinding roar continued for minutes before dying away. Then, as it did die away, as the levels about us ceased to quake, there came strange whistling cries from all about and above and beneath us, a babel of cries of alarm that were sounding out suddenly over all this hidden world. We could make out in the distance, through the dusk that enveloped us, hordes of the flesh-creatures rushing toward some point, and for a moment Darrell and I regarded each other with astonished wonder, then gave the thing up as the uproar of alarm in the levels about us died down somewhat. Whatever it had been that had caused that tremendous shock and quake, that had caused the alarm of the flesh-creatures, we dared not lose time now in the plan of action that we must carry out.

So, creeping again to the corridor, we gazed again around its corner and saw that the two guards in it, shaken and astonished like ourselves by that great shock and detonation, were holding still their stations, apparently discussing the thing in their high, whistling voices. A long moment we looked toward them, reversing our pistols so that we held their barrels club-fashion, both Darrell and I hazarding a last glance up and down the dim avenue in which we crouched to make sure that none of the flesh-creatures were approaching. Then we gathered ourselves there, our eyes upon the two guards, and then with all the power of our muscles in our effort were flying through the air in a great leap toward them!

Fully forty feet down the narrow corridor from us had been those two guards, but buoyed up as we were by the infinitely smaller gravity of this hidden world, we shot down toward and upon them in a single mighty leap! And as we did so, as we curved through the air toward them, they had heard the sound of our jump, had turned swiftly toward us, their deadly ray-cubes coming up toward us. But before ever they could loose the brilliant yellow death within those cubes we had struck them, had hurtled down upon them and had knocked the cubes from their grasp. At the same moment I felt my own pistol knocked from my grasp by the great force of our own impact, and then, as weaponless as the creatures before me, I was struggling wildly with one of those creatures while Darrell grappled with the other!

I felt the great, thick arms at the big flesh-monster's lower body grip me tightly, bear me to the floor by all his great weight, while at the same moment I struck out with all my strength and with clenched fists at the features of the thing. As we rolled and swayed there in that flashing moment the single great staring eye, the strange apertures of the mouth, were directly beside my own face, within an inch of me, and almost those nightmare features so close to my own sickened me into a weakness that would have meant the end. With all the fury of desperate resolution, though, I strove to hammer the monster into unconsciousness, but though my blows for the moment made it impossible for the thing to voice any cry of alarm, I felt my strength fast waning. I had a glimpse of Darrell struggling wildly in that same moment with the other monster beside me, and then the one who held me had shifted the grip of his great arms suddenly to my torso, was tightening instantly upon me those arms in a spine-crushing grasp!

I struck out again, again, again, in that reeling moment, but my blows seemed to fall without effect upon the great flesh-mass with which I struggled. And rapidly, in that instant, as its great grip tightened vise-like about me, I felt my strength fleeing from me in stabs of excruciating pain, felt my senses darkening beneath those thrusts of pain. Then as from a great distance I heard a dull report, and a moment later another. And at the second the grip about me abruptly loosened, and as I staggered up from my antagonist's grasp it was to see him quiv-

ering in a last convulsion of death on the floor, the other already dead! Over them, panting and dishevelled, stood Darrell, his still-smoking pistol in his hand, with which when all hope seemed lost he had slain the thing with which he struggled and then the one that was gripping me.

Now we listened intently for a moment, but there came no sound of alarm that might indicate that our shot had been heard by the creatures in the levels above and beneath. Quickly now Darrell and I were racing a little farther down the corridor, were racing down toward that door which the two flesh-creatures had been set to guard, and into which we had seen our two friends thrust. In a moment we had reached that door, a tall door made of the same transparent or translucent metal as the walls of all the rooms about us. And there, pressed against its inner side, gazing with wide eyes up the corridor toward the scene of the battle we had just taken part in, were the two we sought, were Kelsall and Fenton!

"Darrell—Vance—!" Kelsall's astounded voice came out to us through the little ventilation-holes set in the door and walls of their transparent cell. "Darrell—Vance—for God's sake, how did you two get down here, down into this hidden world?"

"Kelsall!" Darrell was pawing eagerly at the transparent door with myself as he spoke. "We've come after you, Kelsall—after you and Fenton—we saw you there in the great hall, and saw your guards bring you here—!"

"But the door!" Kelsall was exclaiming, inside. "You can never get it open, Darrell—only the leader of the guards that brought me here is able to open its strange lock, apparently."

A Single Hope

BUT now, we had discovered for ourselves already that the great door through which our friends had been thrust into their cell seemed one impossible for us to open, seemed one like we had never seen before. For though we had seen that door open and close, could see now the great hinges to one side of it, the strange dial-like arrangement of a score of studs upon its center that seemed a combination-lock for it, yet those things were the only things that indicated the presence of a door there, since the transparent metal of the door apparently was entirely integral with the transparent metal of the wall in which it was set! There was not the tiniest crack to mark a division between door and wall, the door itself having melted apparently into the solid wall!

We started at it astounded, and then Kelsall was explaining swiftly. "It's the mechanism controlled by those central studs that locks the door," he said. "And it locks the door by making that door part of the wall around it, by using a molecular-diffusion force to mix and intermingle the molecules of door and wall at their edges, thus making of door and wall a single homogeneous substance. When those studs are pressed in a certain very complex combination, they reverse that force, and the molecules of door and wall are sharply divided at once, making it possible to swing the door open. But without knowing that combination, without using it to reverse that force, you can no more swing open this door than you can swing open any section of this wall. And you can't use those guards' ray-cubes to cut through the wall, for those rays are of such terrific power that they'd annihilate the whole cell and everything, ourselves, inside it."

"But how to get you out, Kelsall?" Darrell asked in despair. "We have a sphere here and in it we might get back up the shaft—to earth's surface—"

"The only way is to wait until the other guards return," Kelsall said. "Their leader alone can open and close this lock, and they will come back for Fenton and myself in a few hours. The leaders of these flesh-creatures hold a last great meeting in their great hall, and we are to be brought again before them, since we were given only until then to accede to their demands, death then being the penalty if we do not. Therefore, they will take us out of this cell to take us back to the great hall. Then you and Vance and Fenton and myself must attempt to overpower them, and get away in your sphere. It's our one chance, for never will you be able to open this door yourself."

Darrell nodded. "We'll do it, Kelsall," he said. "And the first thing is to hide these two dead guards and our sphere—"

And he and I, turning toward the two dead flesh-creatures, swiftly grasped them and thrust them out of sight into one of the numerous store-rooms farther along the corridor, hiding them behind a mass of mechanisms in that room. We raced back then to our sphere, and entering it I turned on its lifting power, whirling its control over, sent it humming up through the dusk of the great avenue toward its roof. As it bumped against that roof, hanging there with the hardly audible hum of its mechanism just sufficing to keep the big sphere aloft there and out of sight, I stepped out of it and floated down to the avenue's surface. Then, with all prepared for the coming of the guards, and with the two ray-cubes of the two slain guards in our pockets, we turned back toward the door of the transparent cell that held Kelsall and Fenton, and hid outside that door in the corridor's feeble dusk, our voices conversing through the ventilating-apertures in low tones.

"Darrell—Vance—," Kelsall was saying. "Fenton and I were utterly astounded when we heard your combat in the corridor, looked out to see you two fighting with the two guards. How did you ever get down here—down into this world at earth's heart—down through this world's maze of swarming levels to find us?"

"We saw you two captured by the flesh-creatures there when they came up to earth's surface in their spheres—" Darrell said, and then related the events that had followed, our resolve to follow and rescue our two friends, our thrilling theft of the great sphere and our wild flight down the mighty shaft in it, battling with the two pursuing spheres; our bursting down through the molten fires about the shaft into this vast space at our earth-shell's interior, our rush down toward the hidden world at its center and our vain search up and down its swarming levels in our sphere until, following the other spheres into the great hall, we had seen Kelsall and Fenton questioned there and had followed their guards and themselves to this cell in which we had found them, slaying their two guards at the door to reach them.

Kelsall and Fenton listened in astonishment to this strange tale of our wild journey down after them, and when Darrell had finished Kelsall shook his head. "I never imagined that you two would venture down here after us," he said. "But you have done it, and if we four can escape back again we can bring to our own earth a warning, at least, of this menace."

"But warning of what?" I asked swiftly. "What are these strange flesh-creatures, Kelsall, what their plans? We have seen the shaft they've pierced up to earth's surface, we have seen the vast fleet of spheres they've built and have surmised that they mean to send some great invading party up to earth's surface, but why? Why should they leave this hidden world of which none on earth's surface has ever dreamed—which seems incredible to me almost even now? What were the four great light-shafts that they sent up through earth's shell at four different spots on earth's equator, and that we four came to investigate? What was that great shock that made all this world reel but minutes ago? We heard you and Fenton reply to the creatures in their own whistling speech there in the great hall, though I cannot comprehend how you have learned it in the hours that you have been down here, and so you must know the answer to some, at least, of these mysteries!"

Kelsall's Tale

KELSALL was silent for a moment, regarding me with a strange solemnity through the transparent door. When he spoke his voice was grave, deep-toned.

"I know the answer to those mysteries, Vance," he said, "know now the answer to the mystery that puzzled us above, to the greater mysteries that we have penetrated into here. And so that you may come to know them also, it is necessary that you and Darrell know what befell Fenton and myself after our capture there above.

"You saw us captured on the bare clearing's tip, and after a futile questioning in their strange speech, thrust into one of their spheres. I saw you rising to come to our aid then but waved you back because I knew that you would be captured like ourselves or killed. So we were thrust into one of the great spheres, closely guarded by our captors, and then our sphere and the score or more that were about it there on the ground were rising up and then sinking into the great shaft, leaving the hundred or more patrolling watchfully above and leaving three to guard the mouth of the shaft on the ground about it.

"Down into that great shaft we sank, dropping at terrific speed with the light-beams of all the spheres flashing, whirling down at such terrific velocity that I knew within moments that we had dropped many miles beneath the surface. Then moments later in our terrific drop there came the growing heat about us, and then as the glowing light and heat showed beneath us we were shooting down through that awful light and heat. Then finally they moved a knob and the wall and the sphere became cooler. Between the great shaft's walls grown molten now and out at last into this vast space that lies in the interior of the great shell of earth we moved. Astounded, Fenton and

They bound us tightly with metal thongs, and unable to move a muscle; then turned the projector upon the upper portion of our skulls.

I stared as our spheres sank down toward the world that spun at this great space's center and through the opening in the great hall's roof, our spheres poising at the edge of the great balcony there, our guards leading us forth onto it. They kept close hold upon us and as we stepped out of the sphere we saw why: that the smaller force of gravitation upon this world, less even than it seemed it should have been, made our efforts produce greater results, made each step of Fenton and myself send us floating upward."

"It was to halt this, though, to keep us with them, that the guards held us closely and watchfully, and if you saw us there in the great hall yourselves you must have seen them holding us thus. At that time, though, the great hall was quite empty, but in a moment there came onto that balcony to survey us the twelve flesh-creatures who form what might be termed the highest executive committee of this strange civilization. They surveyed us and the foremost spoke to us in their whistling speech, but of course we did not understand. He turned then and gave an order to our guards, who led us away at once. We walked quite naturally when held down by them. They led us to this storeroom whose strange and powerful lock made it suitable as a prison-cell for us.

"Here, after a little time, there came to us with guards, three flesh-creatures bearing a conical projector of some sort connected to masses of intricate apparatus. They bound us tightly with metal thongs, lying flat on the floor, unable to move a muscle; then turned this projector upon a certain portion of the back upper portion of my skull. There was a droning of apparatus being turned on, I felt some invisible but powerful force pouring from that projector into my brain, and then as the three flesh-creatures altered with wonderful swiftness and skill the controls of their strange apparatus, increased and decreased the intensity of the force acting upon me, I felt a comprehension of the whistling speech-sounds in which they conversed coming upon me! I felt myself understanding, more and more, as that force played upon my brain, the meaning of that strange whistling speech!

"It was but moments, astounded as I was, before I realized what they were doing. You know that the brain is the organ that stores and acquires our knowledge, and that each new thing we learn is registered in our brains by a subtle, infinitely subtle, change in a portion of its structure, in its folds. The tiny change in the brain's structure is, therefore, the register of our knowledge, since if that change is existent it will affect all the rest of the brain's structure. And if we knew the exact change produced in the brain by learning a certain fact, and could take someone ignorant of that fact and make that exact change in their brain, that person would at once know that fact perfectly without ever having heard of it. I would simply mean that the fact had been impressed upon his brain directly instead of indirectly through his visual or auditory nerves.

"It was this fact, one foreshadowed even in our own world by certain experiments of our psychologists, which the flesh-creatures were using to give me an instant and perfect understanding of their strange whistling speech. For their force projected upon my brain was altering the very structure of my brain subtly, was altering it to correspond exactly to the alteration that would have been made had I actually spent months in learning that speech. For when they turned off the force finally, when I arose, it was to find that I understood their speech perfectly, and that I could speak it to them in a crude fashion, my human vocal apparatus not being capable of making all of their whistling sounds. In Fenton, too, the same thing had been accomplished, and then the flesh-creatures who had wrought that swift change in us, had given us that swift knowledge, were conversing at once with us.

"They told us, in that speech, that within a few hours we should be taken back before those ruling twelve, now that we could speak to and answer them. They would question us concerning all phases of life on the earth above; the numbers and powers of its peoples, desiring especially to know whether any above suspected the existence of this world hidden at earth's heart, and also what it had been that had brought us to the exact spot on earth's surface where they had pierced their great shaft upward. Fenton and I, however, told them but litle, for we planned to help them with no information. We did, though, in the guise of conversing with them openly, strive to gain from them information as to the great mysteries of this strange world and its peoples and their plans. And they, seeming not to care if we learned, told us openly enough of the history and the purpose of their great flesh-creature races.

The History of the Hidden World

"IT was in amazement that we heard that history. For these flesh-creatures existed here on this spinning world at earth's heart were, we learned, a race older by far than any race on earth's surface, and their world a world older than the great shell of earth that enclosed it! And as we heard from them how that world had been formed, in the far past, as we learned from them the answers to all those great enigmas that had perplexed us, we forgot almost our own predicament in the interest of what we were hearing—the stupendous life-story of this hidden world!

"Ages, unthinkable ages before, they said, our sun, our star, had moved along through space, with no planets, a giant flaming single sun. Eons it had moved alone, until there came a time when there approached, out of the galaxy's vast swarm of stars another star, a sun heading through space in the general direction of our own sun, passing our own sun at a vast distance, yet one which was but small compared to the usual distances between the stars. And as they passed the tremendous gravitational attraction of the two suns had raised upon each other great tides, colossal flaming tides of glowing gases. So immense were those tides, indeed, that when the two suns had finally passed each other, were receding from each other, the tides which they had raised did not recede but swept onward and broke loose entirely in flaming masses from their giant suns! And as those vast flaming masses broke from our own sun they began to circle around it, held still within its group.

"In this tale of the flesh-creature scientists, indeed, I recognized the accepted theory of the birth of the sun's planets of our own scientists, the theory put

forth by Chamberlin and Moulton and by Jeans and Jeffreys, in England. And, as the flesh-creatures said, those great flaming masses began to condense with time into planets, into great planets spinning about their far greater sun. There were still, though, immense masses of the flaming gases still free, still moving about the sun themselves, but planets had been formed. That planet that had formed at the distance from the sun into meteoric materials, those great clouds of meteoric matter began to be attracted and caught and held by the new-formed planets. Neptune, farthest out of all, caught only enough to form one moon which revolves about it. Uranus enough to form at least four moons. Saturn, toward which great masses of the meteoric material had chanced to be flying, gripped enough to form around itself the giant rings, as well

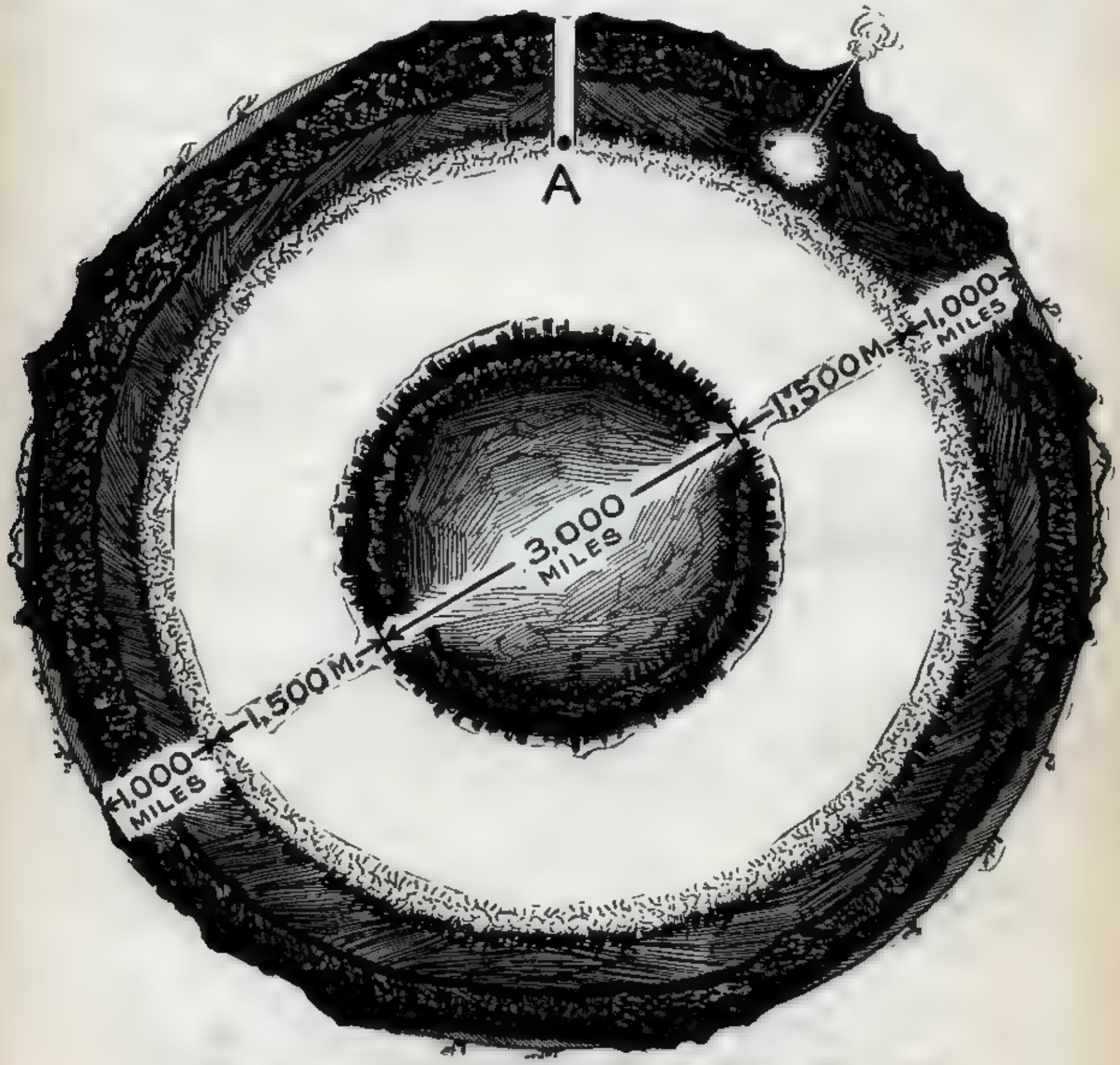


Illustration of the author's conception of the earth's shell with the "Hidden World" within it. At "A" the great battle between the defenders of the earth and the invaders took place.

where earth is now, though, was much smaller than earth is now, was a small spherical world, was, in fact, this very hidden world!

"Thus the sun had its eight new-formed planets, Mercury, Venus and the others, only where earth is now was only this smaller world. And since, as I have said, there moved through the solar system still vast masses of loose flaming gases, condensing swiftly as a number of large moons and some smaller ones. Jupiter, too, gripped much of the material, forming four great moons and a number of smaller ones also. Between Jupiter and Mars a great belt of this meteoric material formed of itself, turning itself about the sun and existing there now. Mars, being out of the path of most of the great meteoric material masses, caught only its two little moons, hardly greater than meteors

themselves.

"But this little world that revolved where earth now revolves lay in the path of great masses of the wandering matter, and so caught quickly to itself immense quantities of that matter. They formed about it much as the similar masses had formed about Saturn, encircling the little world completely without touching it. Only, since this world was so much smaller than Saturn, they encircled it on all sides as well as on one plane, encircled it as a giant *shell* instead of as a *ring!* Formed about it, indeed, a colossal globular shell, hiding it forever from the sun and from outer space. This giant spherical shell that had a thickness of 1,000 miles is our own earth."

CHAPTER VII

How the Hidden World Evolved

"NOW this vast earth-shell," Kelsall continued after a pause, "that had thus formed itself around the smaller world was of necessity almost wholly molten and fiery, from the tremendous heat generated by the rush of its meteoric materials together to form that great shell. But the world hidden within it, which had been formed before the forming of that shell, had already condensed and cooled somewhat, and as it cooled and solidified still farther its elements and vapors cooled into water, into seas that swept its surface while the vast shell of earth around it was still glowing and molten. Air had formed too from those condensing vapors, an atmosphere that filled all the vast space inside earth, and with air and water, with the ceaseless light and heat beating upon it from the great molten shell of earth enclosing it, there came at last to form upon this hidden world the first crude forms of life.

"In the seas they formed, beginning with the first jelly-like organisms evolving out of the changing sea-silt's elements—the first protoplasm that evolved slowly as ages passed into higher and higher forms until at last many creatures moved upon the lands of this central world while the great earth-shell was still almost wholly molten. Another great mass of the meteoric material had been caught by earth as it wandered through earth's orbit, and that mass had condensed into earth's circling moon. But though earth's outer surface gradually cooled and solidified, though there began upon its outer surface the same condensations of vapors and formation of seas, its inner surface was still molten, flaming, and in the heat of that inner surface the hidden world flourished, lit and warmed perpetually by the molten sphere about it. And at last, out of the great races of strange creatures that moved on the hidden world, there rose to dominance the one race of these flesh-creatures, strange creatures who were the product of the ages of evolutionary changes that had taken place there on the hidden world, and who with more and more intelligence ruled that world.

"So that, long before any life had appeared on earth's surface, the flesh-creatures had waxed to great power and intelligence on the hidden world within the earth. They built strange cities upon the hidden world, cities that grew even larger as their numbers increased until at last they were forced to cover all their world with a single great city or mass of structures. And as time went on they raised over that city another mass or level of structures, constructing it as much as possible from transparent metal so as to allow the level beneath to receive some share of the light and heat from the enclosing molten shell. So, through the centuries, they had added level after level to their city, their world, until at last all this hidden world lay as it now lies, with over it a hundred great levels in which swarm the masses of the flesh-creatures. And in those levels, upon this world, the flesh-creatures continued to live on for century after century, age upon age. Far above on earth's surface had come the first stirrings of life also, the first forming of changing, ascending species that in time were dominated by the rising races of man. But the flesh-creatures, on their world, had no interest in the conditions of earth's surface and so never ventured on to it.

"But at last, after age upon age of safe and uneventful existence upon their hidden world, the flesh-creatures came to realize that the end of that world was at hand, that soon the hidden world would perish and with it all their races. And the reason for that was a quite logical one. When this smaller world had been first enclosed by the earth-shell, by the great shell of meteoric material that had formed around it, it had moved about the sun in the same orbit as earth follows now, but had not rotated itself at all. This earth-shell that had formed around it, though, rotated or spun from the first, formed as it was by the meteoric masses rushing in whirl-pool-wise around the smaller world. So that when it had first been formed, earth consisted of a great shell which rotated once each twenty-four hours, just as it does now, and a hidden world inside that did not rotate at all.

"But gradually, in the following ages, this hidden central world had begun to rotate also! For the great shell rotating around it pulled at it with a great gravitational attraction as it revolved, the gravitational attraction of shell and central world being in reality a connection between them. And because of that connection, just as though it were solid and visible, the hidden inner world had begun to slowly rotate in the same direction as the rotating earth-shell around it. Only very slowly at first did it spin thus, but as age followed age the rate of its spin steadily increased, accelerated always by the constant pull of the spinning earth-shell around it. And so at last, but short months ago, it became evident to the flesh-creatures that their inner world was spinning at almost the same speed as earth's shell around it, and that it would spin faster and faster still as time went on until that spinning would end in its own annihilation!

"For the flesh-creatures calculated that within months, when the hidden world should have reached a certain speed of rotation, it could no longer hold together! For, you must remember, the gravitational attraction of this small hidden world upon its own matter was but small in the first place, and its matter was under the ceaseless gravitational pull of all the great shell of earth around it. Now with that shell pulling its matter outward with great force, and with the increased centrifugal force of the spinning world tending ever more strongly to hurl its own substance outward, it was plain that before the hidden world should have reached a speed of rotation equal to that of the earth-shell around it, it would have broken up! Would break up, in fact, like a bursting fly-wheel, all the matter

flying off in tremendous masses into the molten inner shell of earth!

Facing Catastrophe

"THAT meant annihilation, indeed, for the flesh-creatures and all their world. So now they strove with all their power and craft to devise some way to escape that annihilation. They decided, at last, that but one method of escape was open to them, and that was to surge up to the surface of earth's great shell in all their hordes.

"But there was another group among them that believed that the speed of rotation could be lessened and the world be saved. They wanted to effectually brake the speed. They did not believe that their race could exist on the surface of the earth where many conditions would be different.

"So making use of their knowledge they set to work tampering with atomic structure to get forces powerful enough to stop the mad rotation of their world. And they had almost succeeded when they found that the atomic energy they had released was causing convulsions in the structure of their world. That the disintegrating atom was affecting its neighbor and with great rapidity their world was being slowly shattered. Those rumbles that you heard were the signs of it. They are becoming more and more severe.

"So you can imagine these creatures finding that instead of thousands of years in which to prepare for the natural ending of their world they have literally advanced its date so that now it hangs over them ready to end them any moment. When the end will come no one knows.

"The earth-shell, they knew, would not be affected by the bursting of the hidden world inside it, save for a great shock, perhaps. And upon earth's surface they could live, they knew, for though they would be able to move there only with great efforts, they could use their mechanical ingenuity to spare them the necessity of muscular efforts. At any rate, their last chance lay in emigrating *en masse* to earth's surface at once.

"Their decision was made, therefore, the decision that all of the flesh-creature hordes should pour up onto earth's surface. With their instruments of distance-vision they had, more than once in past centuries, gazed upon earth's surface and had seen that upon it ruled the swarming races of men, but they knew that with their great spheres and deadly rays they could annihilate those races. So they began their plans to pierce a great shaft upward through earth's shell, by using a great disk-projector which would shoot upward from their hidden world a giant yellow beam that in a moment would cut a shaft through the earth. That big disk-projector they had erected exactly upon the equator of their own inner world, so that its beams would pierce a shaft up that would have its mouth or opening exactly upon earth's equator also, since used as they were to the ceaseless light and heat of their world the flesh-creatures planned to take no chances of emerging at the first into earth's colder regions. All was ready to pierce their shaft upward, but one problem faced them still. And that was, at what exact spot on earth's equator should their great shaft emerge?

"It was a problem of great importance, to them. For you see that if their great shaft was driven suddenly upward in a town or city or some place swarming with men, the alarm would spread over all earth and before the flesh-creature hordes could rush up that shaft human forces might have gathered about it to prevent them. And, too, should they pierce their shaft up through the ocean's bed, the result would be that a vast volume of water would rush down it and spreading out *inside* earth's shell would cause, by contact with the molten inner surface, great cataclysms of exploding steam that might well wreck all earth. It was vitally necessary, therefore, that their shaft be pierced up through some continent, and at a spot on earth's surface wild and uninhabited. And to enable them to do that, to enable them to make sure that their shaft would be pierced upward at such a spot, they decided first to make use of the distance-vision instrument I have mentioned.

"That instrument was one that projected an intense column or shaft of blue light for any distance and through any form of matter. It projected also, at the same time, a smaller beam of white light that was supersensitive to all changes of light about it, the white beam appearing as a white circle or spot of light near the top of the blue column of radiance. Thus the white circle or beam was in effect a great eye, which recorded upon itself a swift and ceaseless picture of all things about it and which transmitted that picture downward in the form of linked vibrations through the blue shaft of radiance to instruments that enabled the flesh-creatures operating it to see things as though with that great white eye of light. For the white beam or spot was in effect, the eye, whose vision was carried along the blue shaft that was the nerve, to the instruments where that vision was reproduced as in the brain. Only, in this case, eyes and nerve were not of matter but of light that could penetrate all matter.

"So, beside the great blasting-beam disk which they had erected on their hidden world's equator, the flesh-creatures set up a smaller disk which was to project the blue vision-shaft upward through earth's shell. You must have seen that great and small disk when you came down over the hidden world. Then, but a few weeks ago, they put the thing into operation. They turned on the power of that smaller disk and at once a brilliant shaft of blue radiance sprang upward, through the great shell of earth to emerge upon earth's surface just at the equator. And that column of blue radiance, appearing as it did in the native village just north of Kismaya, was the first of the great light-shafts that puzzled us on earth.

The Flesh-Creatures' Plan

"ONLY for a minute or so did they keep that blue light-shaft turned on, piercing up there near Kismaya, and in that minute they were able to see through it as though a great eye, were able to perceive with their instruments that that spot was one in which were many natives, many men. It was, clearly, not a suitable place for their great passageway to be pierced upward, and so they turned off the blue ray and it vanished above. They planned, however, to send that blue light-shaft up again through earth's shell at its equator, but so that there would be more chance of finding some spot suitable for their purpose, planned to send that vision light-shaft up through earth's shell at three more places, each a fourth of the equator's circumference from each other. By doing that, by examining

with the light-shafts four equi-distant spots around earth's equator, they would have a strong chance of finding in some one of those four spots, at least, a spot suitable for what they desired, a spot wild and uninhabitated.

"They did not need to move their disk around their own hidden world to shoot the light-shaft up at a different spot. They needed only to wait until that next spot selected, a fourth around earth's equator, had moved directly above their disk. For as I have said, their hidden world spun somewhat more slowly than the earth's shell about it, and so by waiting for a number of days the next selected spot on the earth shell's equator would be directly over their disk. And within twenty days and some hours, in fact, that second spot was directly over their disks, since it took that length of time for the swifter-spinning earth-shell to gain a fourth of a rotation on their own spinning inner world. So when that moment came, when the next spot a fourth around earth's equator was overhead, they again sent the vision shaft stabbing upward, and this time it came through the Pacific on the equator, just south of Moram Island.

"They could see by means of it that that spot was on the surface of a great ocean, and that to pierce a shaft upward there would mean the downrush of great waters into it. So they snapped out their shaft and waited again, waited another twenty days and six and a half hours until the earth-shell around them had gained another quarter-revolution upon their inner world, until the spot another fourth around earth's equator was above their disks. Then they sent a third great light-shaft stabbing upward, and that one emerged in the broad open expanse of Pacific, emerging on the equator just ahead of the the *California*. They saw that this third spot also was impossible for them, and so snapped out that light-shaft also and prepared to wait until the fourth designated spot would be above their disks. Meanwhile, in all their hidden world, every effort of the flesh-creatures' hordes was being used to construct the mighty fleet of spheres that would carry all their races up to earth's surface. And meanwhile also, we four, on earth's surface, had resolved to solve the mystery of these strange light-shafts and were making our way to the spot where we had calculated that the fourth would appear.

"And our calculations were right, as you know. For when the interval had elapsed, when the fourth spot on earth's equator was directly over their disks, the flesh-creatures sent their fourth light-shaft stabbing upward. Through it they saw, at once, the land and that it was as uninhabited and wild as they desired, a great jungle expanse about it. They had found their required spot, and so at once, snapping out the light-shaft of vision, they turned on the other titanic greater disk beside it, the giant disk that sent a colossal yellow disintegrating beam stabbing upward! And that beam, driving up with all its colossal blasting power, in an instant had pierced a great shaft straight up through earth's shell, driving that shaft almost instantaneously up and out of earth's surface before our eyes.

"Now at the moment when the great shaft was driven upward, the flesh-creatures had assembled and ready upon their world more than a hundred of their great spheres with their flesh-monster crews, all being equipped with the deadly yellow beams. And in the moment after the shaft was blasted upward, these scores of spheres shot up at once from the hidden world, up and through that shaft at terrific speed, their light-beams flashing, up to earth's surface the first of all the great hordes of flesh-things that were to follow! For though the shaft had been pierced up and all was ready for the flesh-thing races to pour up through it their mighty fleet of spheres was not yet quite finished, would not be finished for another day or two. So these hundred or more spheres were sent up to guard the great shaft's mouth, to prevent any who might discover it from giving the alarm or trying to wreck the shaft itself.

"Fenton and I running from them, toward the clearing's tip, were seen; instantly they were after us, captured us, and were taking us down as prisoners to this hidden world within earth. And when they had brought us down here, before their twelve rulers, those rulers had ordered them to give us at once knowledge of their speech so that they might converse with us. This they had done, by means of that strange brain-alteration mechanism, and when we had found ourselves able to understand them had told us these things concerning the history and the plans of the flesh-creature races.

Withering Doom

AND it was a tale, that, which Fenton and I heard with growing horror. For we saw that these beings could do that which they planned, could surge up onto earth's surface in all their hordes in their numberless spheres and in those spheres could sally out over earth and annihilate mankind. And our horror was deepened when we learned how near to earth was this doom of which we had just learned. For, we found, the last preparations were even then being made, the last spheres of their tremendous fleet were being completed. Within hours, within hardly more than a day, in fact, all those spheres would be complete, and gathered in the lowest levels of this strange world, the hordes of flesh-creatures of all that world would be pouring into them. And then those spheres in all their countless thousands would be rising upward through the mighty shaft onto earth's surface. And once they had passed up through that shaft, once they had emerged onto earth's surface, no power upon earth could stay the doom that would be mankind's.

"Almost ready were they to rush forth over earth, indeed, and they needed to be so since here in their hidden world their own doom was almost upon themselves! For it was fast approaching. Their scientists had calculated that within less than two days more, in fact, the long-awaited explosion of their disintegrating world would occur, and its great mass would break up, would go flying outward in millions of pieces. So they had strained every effort to complete their spheres before that time to rush up through the great shaft but a short hour or two, in fact, before the final cataclysm of their world comes, so closely were they pressed for time. And even as the flesh-things told me this there came a great warning of the cataclysm that was almost upon them.

"For about us even then the whole hidden world seemed to reel and quiver violently, while to our ears came a tremendous distant grinding and roaring sound. When that had died a great alarm spread across all the hidden world, through all its swarming

levels, and then a little later we learned from the flesh-things guarding us, what had happened. A great section of this hidden world had just then suddenly jerked loose from it and gone flying out toward the molten encircling earth-shell about us! And it was another such great throwing-out of part of this inner world's mass, without a doubt, that caused the similar shock and alarm but a little while ago, while you, Darrell and Vance, were creeping toward our two guards here. For as this hidden world approaches the point when it will break up completely, these great shocks are giving warning of that mighty, impending cataclysm!

"That first great shock, indeed, sent alarm over all the hidden world, made the swarming flesh-creatures in it redouble their efforts upon their great fleet of spheres that was almost now completed. For they knew that even with their greatest efforts they would not be able to rush upward and escape from the hidden world but a short hour or so before its final breakup comes. And also they were fearful now that if another great mass were to jerk loose from this spinning world and happen to strike the opening above of their great shaft through earth's shell, it would wreck that shaft completely and thus trap them here inside earth's shell to be annihilated by the giant flying masses when the moment of this world's final breakup came.

"So they worked on furiously at the great spheres. Our guards had told us that we had nothing to hope from any above, that the hundred spheres were still guarding the mouth of the great shaft on earth's surface, and so we never dreamed of you, Darrell and Vance, being able to get down here to us. We had been told, also, that another hundred spheres had been sent up to relieve the first hundred, the first party coming back down. For though the spheres can run for great periods, though the flesh-creatures with their fatigue-neutralizing fluid need neither sleep nor rest, the projectors that shoot forth the deadly yellow rays must be charged with new stores of the ray, new supplies of electronic force, whenever exhausted. And they knew that the guarding spheres above would be using their rays on everything that approached the shaft, on every sign of danger, and a relief party with full ray-charges relieves the old for the time being, the others coming back down to renew their own ray-charges.

"Hardly had they told us this, though, than there sounded out through all the levels of this strange world that great whistling call, that great sound that was the signal to call the officials of each level to the great central hall. For each level has its scores of officials and there is a single flesh-creature who rules over each level. Of these hundred level-rulers are formed the ruling body of all the hidden world, of all the flesh-creatures, and it was by them that we had been already examined. Now as the officials rushed toward the great hall in their spheres, hanging there in those spheres since in that way they could all enter the hall and remain in it conveniently, Fenton and I were taken by our guards there also. There, behind the great balcony, we heard the leader of the twelve rulers speaking to the assembled officials, telling them that the great fleet of spheres was almost finished but that they must put every effort into the completion of them within the next hours. For, as he told them, it had been calculated that within twenty-four more hours, almost exactly, there would come the final breakup of their world, and they must needs have the spheres finished and be rushing up to earth's surface before that final cataclysm came.

What Hope?

"THEN, at his order, Fenton and I were led out onto the balcony, all the great spheres hanging before us there in the mighty hall. We never dreamed, of course, that you two, that Darrel and Vance, were hidden in one of those spheres and watching us. When the leader spoke to us it was to tell us that our world was doomed and that our only hope of life lay in the mercy of them, the flesh-creatures. Within a score or more of hours, he said, all the flesh-things in their thousands of spheres would be rushing up to earth's surface, to spread out over it and to loose upon man and the races of man an annihilation they could not resist. He said, though, that they desired to strike their first blows directly at the greatest cities of earth, to annihilate those cities and all in them with their countless spheres and their rays in their first attack. It would save time for them, therefore, if we two were to pilot their great attacking forces to those cities when they emerged upon earth.

"To that proposition I answered only with the flat refusal of Fenton and myself. For even were we to save our own lives, in that way or in any other, of what value to us would be a life on an earth peopled only with the monstrous flesh-creatures? So we refused, and when we did refuse the great leader of the flesh-things told us that death would be our lot if we continued in that refusal. For, he said, the rulers and officials of the flesh-things would assemble there again in the great hall just before their races poured up to earth's surface in their great sphere-fleet, ten hours from then. And if we continued to refuse then, he said, instant death would be ours. To his words, though, both Fenton and I spoke only a single word of refusal still, and then, as a great stir of anger swept through those in the spheres before us, the leader had ordered us taken back to this prison-cell to await that last meeting in the great hall at which, before their mighty armada rose upward, we would meet their demands or die.

"So we were brought back here, into this cell, and having been locked within it were left with two guards at our door. We heard and felt soon another great quivering and shock of the world about us, knew as we heard the resulting alarm that another mass of this hidden world's substance had jerked out from it, another great warning that the final cataclysm was near at hand. And then came a sudden wild combat in the corridor outside and we saw you, Darrell and Vance, whom we had thought far above on earth's surface, leaping upon our two guards. And so now, Darrell and Vance, you know what we have seen and learned in this hidden world since we were brought down captives into it but little more than a day ago, know as we do what doom these races of the hidden world, these great flesh-creatures, plan to loose upon our own races of men."

Darrell and I sat silent there, in the dusk of the corridor outside the transparent door, as Kelsall's voice ceased. Through that dusk I could see that Darrell's face was as white and tense as my own, that he even as I was in that moment realizing for the first time the full horror of the doom that was rising upon our earth. Then, his voice came sounding strange and thin to my ears.

"But is there any hope of halting this thing?" he

said. "Is there any hope, even if we get you out of here, of halting this invasion that will sweep over our earth?"

Kelsall slowly shook his head. "There is but little hope, I think. For even if we escape up from this hidden world to earth's surface, the hordes of the flesh-things in their spheres will be pouring up behind us."

"But we could at least warn the peoples of earth of the impending attack before that attack falls upon them!" I exclaimed, and Kelsall nodded.

"That is the one hope left us, Vance," he said. "Yet even if we can carry that warning to mankind I do not think, myself, that man can stand before the terrific attack that these creatures will loose upon earth with their rushing spheres and blasting rays. But as it's our one chance left we'll put our lives on it."

Awaiting the Hour

HE WAS silent, and were Darrell and Fenton and I there in the dusk of cell and corridor. In that corridor and those about it, through the maze of store-rooms and transparent-walled halls that lay about us, there moved still none of the flesh-creatures. Yet in all the rest of this strange world about us, in all the swarming levels about and above and beneath us, there seethed still the prodigious activity which Darrell and I had seen and which appeared now to be rising to a great crescendo of sound and activity as one by one the last twenty-four hours passed, as hour by hour that final hour approached which would see the flesh-hordes whirling upward. For at the end of that time as a limit, as Kelsall had said, their calculations had informed them that this spinning world of theirs could no longer be in existence, so that they worked now with an utter intensity of effort to finish their last preparations and escape from their doomed world.

Even from the dusky corridor we could glimpse vaguely, through the transparent walls and levels about us, the rushing movements of the hordes of flesh-creatures about us. It seemed to us that now the great sphere-fleet had been completed, since the great clangor of metal upon metal from the lowest levels was no longer coming to us. Now, though, apparently, the flesh-things were engaged in loading into those spheres the equipment and weapons which they were to take with them. We saw some of them busy charging the great ray-containers of their spheres, fitting those weapons back into those spheres; could see others who were swiftly disassembling into sections the great cylindrical machines which manufactured their food-liquid, the other mechanisms that turned out their metals, and loading those disassembled mechanisms also into their countless great spheres.

Once, too, Darrell and I were forced to shrink back from our position in the corridor as there raced along the avenue to the side of it a group of a score or more of flesh-creatures who swiftly selected the mechanisms they desired from the store-rooms beyond us, and loaded those into other spheres also. But they had passed beyond us and out of sight in the dusky halls in a moment more, the greater part of the mechanisms and the materials stored in the rooms about us being ignored by them. It was evident that they were taking with them to earth's surface only the essential mechanisms, those for the creation of food and metal and power, as well as their great weapons. For, as well we knew, with those mechanisms and with the science that was theirs they could swiftly enough draw out of the exhaustless materials of earth's surface what materials they needed, could create out of those materials with their great electronic element-changing mechanisms what substances and forms they needed.

While all this last climactic roar of activity and sound went on about us we four remained there, Darrell and I outside that impenetrable transparent door and Kelsall and Fenton within it. And dark and strange enough were our thoughts then, as hour after hour sped by thus, as moment by moment the last hour approached. For we knew that only when the guards came to take Kelsall and Fenton before the last great meeting in the great hall could we hope to rescue them. And we know, too, that that would be but minutes before the assembled countless spheres and hordes of the flesh-things poured upward, so that even did we win clear to earth's surface by some miracle the invading masses would be close behind us. Yet we knew, as well, that, even had we been willing to leave our friends to death, we could not hope even in the sphere to win undiscovered through the wild uproar of activity that was now going on in all about us as the last hour approached, as the last preparations were made. It was only when all the flesh-things had entered their spheres, only at the last moment indeed, that we dared risk our break upward.

Once, though, in those last terrible hours in which we four waited with darkening thoughts for the coming of the guards, there came a break to the ceaseless activity in the levels about us. That was when, without warning, another great shock shuddered through the world about us, the floor heaving beneath us and all about us trembling violently as the grinding, immense sound came to us from far away. So violent was that shock, indeed, that the transparent metal roof high above us, the floor of the level over ours, bulged downward and cracked swiftly along one side, making us fear for the moment that a great section of it was coming down upon us. It held, though, and in moments more the great babel of cries of alarm that the shock had caused in all the world about us had died away and the work about us was going on more swiftly and furiously than ever.

"Another shock!" exclaimed Kelsall to us, his eyes wide. "Further signs of the end—another warning that this world's doom is at hand!"

"And at hand soon," said Darrell. "It's less than a half-dozen hours now to the last hour you mentioned —these flesh-things must finish swiftly if they're to escape from here before then!"

The Last Call

BUT that great quake that had just shaken their world seemed to have spurred the flesh-things about us, above and beneath, to even greater efforts. All about us we could now see them in the distance, working furiously to load the last of their equipment into the great spheres, rushing madly now to complete their last preparations. For they knew, even as Darrell had said, that within a few hours now their spinning world would be bursting into death, and that they must escape up the shaft to earth's surface before that took place. So, pressed on thus by utter necessity, they were rushing like insane beings upon their last tasks, were placing in the countless spheres of their fleet the last of their equipment and weapons that would enable them to conquer earth's face.

With a growing suspense, now, Darrell and Kelsall and Fenton and I waited there, as those last hours passed. One by one, each hour seeming ceaseless

to us, they dragged by, until at last but little more than a single hour remained before the moment of the last great cataclysm. By that time the last preparations appeared to have been completed about us, for now the wild clanging uproar of intense activity in all the hidden world's levels appeared to have dwindled, ceased almost entirely. We could see the flesh-things hurrying toward the great spheres, which had been brought up from the lower levels now and filled all the levels about us, apparently, though in the narrow corridors and avenues about us none were passing. We saw the flesh-thing hordes pouring into those spheres, knew with a growing tenseness that the time of our chance, the moment when we could alone rescue our two friends, was approaching. Then suddenly, through the strange silence that had fallen thus quickly upon all the hidden world's levels, there sounded a mighty whistling note that shrilled through the air to our ears from far away!

"The signal!" Kelsall exclaimed. "The signal that calls the rulers and officials of the flesh-races to the great hall—it means that they're preparing to start upward, that we'll be brought before them for the last time!"

"Then at any moment the guards will be here for you!" said Darrell. "And now is our chance to get you free—Vance, you know what we must do?"

I nodded quickly, for Darrell and I had in those waiting hours evolved the plan by which we hoped to get our friends free and destroy the guards who would come to release them. With a quick glance out into the main avenue from which the corridor branched I assured myself that our own great sphere was still hanging out of sight against the ceiling of this level. Then Darrell and I waited, listening intently, crouching still against the door of our two friends' prison. The silence that had fallen upon the levels of the world about us was almost complete, now, but we could see within those levels countless massed spheres filling now with the last hordes of the flesh-things, other spheres of officials or the like that were rushing across the levels toward the great hall to which the whistling summons had called them. Then there came the sound of approaching steps, of a group of flesh-creatures marching quickly down the avenue toward our corridor!

Standing erect, we leapt to the corridor's edge and peered down the avenue, to see in it, approaching us, eight great flesh-thing guards, armed all with ray-cubes, the eight guards indeed who with their two fellows whom we had slain had brought Kelsall and Fenton to this cell. Already they were near to our corridor, and as we saw them Darrell and I leapt back toward the door of our friends' cell, and then, with a greater effort, leapt upward. Instantly we had shot up to the very roof of the corridor, high in the dusk above, floating smoothly up toward it and hovering for a moment beneath it. There we reached swiftly toward the great crack that had opened in that roof, hooked our fingers inside it, and thus hanging there high in the dusk from the corridor's ceiling, awaited the coming of the guards. We could have hung by one finger, indeed, so small was our weight against the lesser gravitation of this strange world.

Hanging there thus high in the dim twilight that reigned about us, we heard the steps of the eight guards approaching, saw them in a moment turn into the corridor beneath us. They did not, of course, give even a glance up toward us, but as they paused before the door of our two friends' cell we heard whistling exclamations from them, exclamations as though of surprise. Their leader was looking about him, we could see, and it was evident that he was astonished to find that the two guards he had left before the cell's door were nowhere to be seen. I feared, in that moment, that he was about to conduct a search for them, knew that such a search would disclose their bodies in the nearby store-room where they were hidden and thus frustrate our last chance. But apparently time was so pressing now as the last hour of the hidden world's life approached that the leader dismissed the problem of the two missing guards from his mind, seeing that his two prisoners were safe inside the cell.

For after another glance around, we saw him turn toward the door, reach his tentacle-like finger-appendages toward the score of studs set at that transparent door's center. One by one he was pressing them, in a certain complex combination, pressing them for some moments until there came a sudden low hum of force from some mechanism set behind those studs. At once straight cracks appeared in the solid transparent wall, cracks that outlined a high door, and then the leader reached forth and had swung that door easily open on its great hinges, at the same time motioning Kelsall and Fenton to step outside. And as they did so the eight guards stood before them with their ray-cubes retained watchfully in their grasp.

But now as Darrell and I, hanging there in the dusk high above, saw Kelsall and Fenton step among those guards, we reached in our pockets, grasped our own ray-cubes which we had taken from the two guards we had slain. Quickly, with the little ray-opening pointing downward and with our thumbs upon the buttons in the cubes that released their rays. Then as Kelsall and Fenton stepped out among the flesh-creatures Darrell and I released suddenly our holds upon the ceiling-crack and dropped smoothly downward toward the guards beneath! As we did so I uttered a quick, sharp cry and instantly Kelsall and Fenton had leaped sidewise toward the avenue and at the same moment, as the guards looked swiftly upward for the source of that cry, Darrell and I had pressed the button-controls of our cubes and sent our yellow blasting rays stabbing down among them!

The Battle in the Corridor

THERE was a sharp little detonation from beneath in the next instant and at the same moment two of the eight guards beneath us abruptly vanished, annihilated by those rays! We had not dared to use the full power of our ray-cubes, since to do so would have blasted downward such a hole through the level's floor as would have given the alarm instantly in all the world about us. But we had at least been able to make the odds more even, and now before the astounded six remaining guards could collect themselves, could loose their rays upon us, Darrell and I were falling upon them from above and at the same moment Kelsall and Fenton had leaped back upon them, so that in the next moment we four earth-men and the six great flesh-creatures were grappling there in a wild struggle in the narrow corridor!

They dared not use their own ray-cubes in that fierce hand-to-hand struggle, we knew, lest they annihilate their own fellows, and for the same reason Darrell and I had dropped our cubes as we leaped down onto them. We had, though, at the same moment whipped our pistols from our belts and using the heavy automatics again in club-fashion were dealing great blows with all our force at the creatures before us. In that first

stunning moment of amazement for them we four had leaped upon them with such fierceness that the fury of our attack staggered them, sent them reeling back against the wall, one of them beaten down to the floor even in that moment by our great blows!

Only the immensely increased power of our earth muscles on this smaller world it was, we knew, that enabled us even to strive against those great monsters, but as it was we had already stretched one of them dead upon the floor with our terrific blows and were struggling toward the main avenue, toward our sphere that rested at its ceiling, despite the wild efforts of the creatures that had gripped us. Their ray-cubes they had dropped at the beginning of our wild hand-to-hand struggle, but with all their great strength they sought to bear us downward, to overcome us. I heard a hoarse exclamation from Kelsall, saw that two of the creatures had gripped him, were pulling him down, overpowering him, and instantly I was at his side. Then, with a terrific effort that only our ultra-powerful muscles in this world's lesser gravitation could ever have accomplished, we four had gripped the massed five flesh-monsters before us and had flung them from us, had flung them with all our power back down the corridor through which we had struggled, back toward the open cell-door!

The next moment we had gathered ourselves, were on the point of making a swift leap up toward our sphere that hung at the avenue's ceiling high above us, to escape outward in that sphere. But at that moment, at the instant that we paused for our upward leap, there came a hoarse cry from Darrell and we whirled to see him pointing back down the corridor, with trembling finger. And as we wheeled to glance there, we stood in that moment as petrified as he. For there where Darrell and I had dropped upon the flesh-creatures, where we had just flung our five antagonists, there stood those five flesh-creatures. They had grasped from the floor the ray-cubes that had been dropped there at the beginning of our wild battle and now were raising those deadly cubes straight toward us!

CHAPTER VIII

Intervention of Fate

IN THAT MOMENT it seemed to me that the whole rushing scene of wild action in which we had taken part in the last moments had been converted suddenly into some set tableau, so motionless did we stand for that instant as we faced death. Another moment, we knew, would see the yellow rays leaping forth upon us. Never even with our unearthly agility could we reach those flesh-creatures before they loosed those rays. It was the end, at last—the end of all our great efforts to escape, to carry a last warning to our world. The end—

But in the next instant, as we stared toward those cubes from which death would leap upon us, there came a sudden tremendous heaving and rolling of the floor beneath us, a violent shock that shook all the levels of the hidden world about us and that made the five flesh-creatures down the corridor stagger even as we! A

From that new position our rays were driving shafts of instant annihilation down through their now huddled disorganised mass. A third of their number was annihilated.

great shock that made all the world about us quiver, giving rise to a far uproar of alarm, and that made the section of roof or ceiling above the corridor, above the flesh-creatures, which was already cracked, crack farther, break loose and whirl downward! Downward it fell and in another moment had crashed down full upon the mass of five flesh-creatures who held their ray-cubes toward us!

The next moment they had disappeared beneath that great mass of transparent metal, four of them crushed to instant death by it and the other one knocked backward as it struck him glancingly, knocking the ray-cube from his grasp! Backward he reeled into the corridor's dusk, and at that moment there came from above and beneath and from far across all the hidden world's levels, in which waited the countless spheres loaded now with the vast hordes of the flesh-creatures and all their weapons, a great far-reaching cry of fear and alarm. For it was another great jerking loose of matter from this disintegrating world!

"Up to the sphere!" Kelsall was crying wildly now. "Up to the sphere and out of this world—its final hour is almost here now!"

In a second we were leaping up toward the open round door of our sphere, hanging at the ceiling of the avenue high above us. Our great leaps sent us whirling up smoothly through the dusk like swimmers rising to the surface, and as we caught the edge of the sphere's open door, drew ourselves inside, I leaped to the sphere's controls. Its mechanism was still humming slightly, with the power required to keep it aloft thus, but now as Kelsall slammed shut the door I had gripped the two control-wheels and had sent the sphere leaping forward and downward through the great avenue. But even as I did so Darrell was crying out, behind me, and as I spun the sphere half-around, glanced for an instant behind us, I saw that along the avenue from behind, a score or more of other great spheres were rushing upon us!

My first wild impulse was to send our own sphere leaping forward in mad flight, but the next moment I realized that the rushing spheres behind us were not pursuing us but were of those rushing toward the great central hall in answer to the whistling summons that had sounded moments ago. To flee from before them would be to excite their instant suspicion, so, as they drew closer to us, I held the sphere steady with them, their occupants never guessing but what our own great globe held officials bound, like themselves, for the last great meeting in the central hall. Kelsall and Fenton were gazing tensely at the spheres behind us, Darrell ready at the controls of our sphere's rays, all of us crouching down to avoid the gaze of any who might chance to survey us.

"They're going toward the central hall," I said to the others as we shot onward among those rushing spheres. "They're taking us with them!"

"Keep with them, then!" Kelsall exclaimed. "If we leave them now it will arouse their suspicions at once!"

"And the wells!" Fenton cried. "The wells are shut out to us by the massed spheres gathered around them and waiting to go! We'll have to try to escape from the great hall itself!"

I saw that what Fenton said was true, that about those wells that led upward through the hidden world's levels were gathered now countless ranks of motionless spheres, waiting for the command that would send them upward. To force our way through them and up out of a well now would be to challenge instant discovery, so with a strange dread growing in my heart I kept our sphere racing onward with those about it, toward the great hall. And surely that flight of Kelsall and Darrell and Fenton and myself, across this dim-lit level of the hidden world at earth's heart was without parallel. For all about us stretched those massed ranks of our enemies, and it was only here and there that there moved still outside of them a few flesh-creatures. A tremendous silence seemed to reign over all this world as its last great hour approached.

But now our rushing sphere and those about us were nearing their goal, the great high door or opening that led from the fifty-ninth level out over the balcony into the great central hall. One by one the spheres shot through that great door, and as our own followed them, I was aware of the twelve rulers gathered there on the balcony, surveying the spheres.

The Last Conference

As unobtrusively as possible, I sent our sphere worming forward and upward slowly through the thronging spheres about us. The spheres were shifting their own positions slightly as though in anxious restlessness, as they waited for their last fellows to enter the great hall, for their leaders to speak to them. From the opening of the sixth level around the hall, now, the last of the summoned spheres were rushing into the hall, taking their places among the masses around us, but I knew that in a few moments more we would have made our way up through those masses to the opening above. Already hope was flickering stronger in me, but then suddenly it died. For the centermost of the twelve creatures on the balcony, the leader of the twelve rulers, had at last risen and stepped out to that balcony's edge. And as he did so all the spheres in the great hall had ceased abruptly their restless movements and hung motionless, awaiting his words.

As they did so I halted instantly the upward movement of our own sphere, though with a groan on my lips. For I knew that with all other globes motionless in the great hall about us our own, striving to make its way upward to the opening through them, would be instantly noted, and we as instantly discovered. So with the opening in the roof still a few hundred feet above us and with massed spheres between us and it, our own globe hung motionless among those others. Meanwhile the flesh-leader who had stepped to the balcony's edge was surveying the assembled spheres before him as we had seen him do before. And we noted, in that moment, that beside the balcony there hung a single sphere also which was of black metal instead of the gleaming metal which formed all the rest, and that waited there with its door open. It was, we comprehended at once, the sphere in which the twelve rulers there on the balcony would lead the others upward, up through the shaft to earth's surface!

The creature standing there at the great balcony's edge began speaking in his strange whistling tones. And as we listened, Darrell and Kelsall and Fenton listening as intently to him as myself, it seemed to me, despite myself, that in that scene was something of a grandeur of majesty of power that was none the less real though in no way human. The ruler was speaking to his peoples, no doubt about their great migration upward from this world that had been their home always. Awed despite ourselves we listened, and as we listened Kelsall, beside me, was swiftly translating to us the words of the thing on the balcony.

"He says," whispered Kelsall rapidly, "that we

There came from the hidden world spinning far beneath them, a colossal thunderous roar. The sphere of the hidden world was breaking into colossal fragments.

flesh-creatures (I am using his own words) are on the eve of the most important, most colossal event that has ever occurred in our history. For numberless ages we have dwelt upon this world of ours, this world that lies at the heart of the great shell of earth. But now a fate has crept upon this world, which, according to our scientists, will cause its final tremendous annihilation. For now all about us there waits our great fleet of spheres that holds all our races, and in that fleet we are about to leave this inner world of ours forever, to burst out upon the outer surface of earth's shell and take possession of it for ourselves.

"You have been told, though, that that outer surface is peopled, and you have seen the two prisoners of those peoples brought down here, prisoners even now being brought here for a last hearing of our demands. Those peoples of earth's surface, though, have not the science or the weapons that our older race has developed and they cannot stand before us. And the word which we leaders give to you now at the last, and to all our spheres and hordes, is to strike out with all your powers to annihilate all those peoples, from the first moment that we emerge onto earth's surface. Not one of them must we leave living upon the face of earth! For it is only by wiping out entirely every vestige of life upon earth's face except for ourselves that we ourselves can bring all earth's surface to our will, and can hold it for ourselves forever."

The creature upon the balcony paused, and as Kelsall finished his quick, whispering translation beside us I saw his face and those of Darrell and Fenton as white and grim with horror as my own. At those words of the great flesh-monster, though, a wave of wild excitement seemed to surge through all the occupants of the massed spheres about us, those spheres swirling and tossing about as from their occupants there came great whistling cries that merged into a single roar of strange voices. Fenton turned toward us, his face tense.

"You heard him say that the two prisoners were being brought to this hall!" he exclaimed. "That means that we must escape from here now if at all!"

"We've got to chance it!" Darrell agreed. "For they'll learn in moments now that their prisoners have escaped!"

Discovered!

I GRIPPED the two control-wheels, then looked upward. A great mass of spheres lay still between us and the roof-opening high above us, but now in their occupants' excitement those spheres were moving jerkily about, bumping to this side and that against each other, and I saw that it was, truly, our last chance to get out of this great hall. So, carefully and slowly, I sent our own sphere rising upward again, up through the swarming globes above us toward the great opening. With Darrell and Fenton and Kelsall as tense beside me as myself, I kept our great globe slowly rising, bumping each moment against the spheres above and about us!

Up—up—those moments in which we rose saw our hope rising stronger within us, for we knew that moments more would bring us up to and through the opening. Suddenly there rang out from the great balcony, over the ruler's voice, a wild whistling cry! A great cry of alarm at which we turned to see. There upon the balcony by the twelve rulers, a single flesh-creature who had staggered out through the door toward them! A single flesh-creature whom we recognized instantly, by his battered appearance, as that single guard who had escaped the falling metal that had destroyed his fellows. He was crying something in his whistling voice, and as he did so there came another and greater cry from the ruler, and an uproar of wild cries and confusion seemed suddenly to break out inside the great hall.

Kelsall whirled toward us, his face white. "That guard!" he cried to us. He told them we escaped in a sphere—and they'll find us here in seconds, now!"

Even as Kelsall cried that, indeed, all the hanging spheres that had poised about us were rushing in confused swarms here and there in the great hall, their occupants peering into each other's spheres and flashing their light-beams into them, searching for us! And in the next moment one just beside us had flashed its beam through our window and a whistling cry of discovery went up from that sphere as its beam caught and held us in our own great globe! We were discovered!

"Up to the opening!" Darrell yelled, beside me. *"Smash up through them to the opening, Vance—they've found us!"*

But even as he shouted that to me I had whirled over the control wheels and had sent our sphere rushing at top-speed upward! *Crash—crash*—into the spheres above us we drove, flashing bullet-like up among them in that moment even as they whirled there in wild confusion! Beneath us, from the sphere that had discovered us, there seared upward a quick ray of yellow death, but before it could find its marke we were above it and that yellow ray had struck two spheres beyond us, had annihilated them instantly! But still we were crashing upward among the swarming spheres above us until in the next flashing instant I saw that a flat solid mass of them had grouped there above us to bar our progress, and since to crash into such a mass squarely was to annihilate ourselves I shot our sphere sidewise from them, dodging like light among the swirling scores of spheres to our right!

All the mighty hall was in such a wild confusion of mad excitement in that moment that all things about us seemed a mad panorama of wildly-whirling spheres as I drove our own globe sidewise. For all the massed spheres in the great hall were swarming furiously and swiftly and aimlessly about it like a great furious swarm of aroused bees! They dared not, in that moment, loose their rays upon us, upon our swift-flashing globe, lest they annihilate their fellows as one ray had already done. But no such consideration held us, and as we shot sidewise to avoid that solid mass of spheres above us I heard Darrell's yell of defiance, as he gripped our ray-control! And then glimpsed our sphere's rays driving out to right and left and above and beneath us, driving out from all the spheres six ray-openings and cutting dazzling yellow lanes of death and nothingness through the massed whirling spheres about us as we shot sidewise and upward!

That terrific moment of wild rushing movement and battle seemed extended in that moment to an indefinite period of time, and though our sphere was leaping upward now toward the opening like a rifle-bullet it seemed to me then to be floating slowly upward only. I saw in that moment the twelve rulers there on the balcony far at the great

hall's end, rushing into their own waiting sphere, and then as we flashed upward through the swarms around and above us, there was coming from all around us still the sharp detonations of the striking rays that Darrell was loosing on all the globe-ships about us!

Now, too, the flesh-creatures' rays were stabbing from all sides toward us, regardless of effect, but before they could reach us we were beyond them, rushing madly up through the swarming spheres until in a moment more the great circular opening loomed just above us!

But suddenly there came wild cries from Fenton and Kelsall and I saw that there had rushed suddenly across that opening a half-score of spheres that hung now within it, barring our path! Before we could use our own rays upon those spheres, I knew, their rays would have found us, so in that mad instant I put all our lives on one last made chance, jerked open the speed control to its utmost! The next instant we were hurtling at utmost speed straight toward those massed spheres, and in another moment like an upward-driving meteor had crashed squarely into them!

CHAPTER IX

The Doom of a World

THE next moment there was an awful, reeling shock that flung us all sidewise, a great grinding of metal on metal, and then as I staggered up again I saw that our sphere was *through*, had crashed up through those barring spheres and was rising up from the hidden world's surface, into glowing light of the vast molten shell about it! For chance had made us strike just between two of those spheres, and instead of annihilating ourselves in it, our sphere's curving metal sides had driven the two spheres we hit apart, allowing us to drive in that instant up between them, up through the great opening!

"Straight up to the shaft!" Kelsall was screaming now to me above the rush of winds and the great humming of our sphere. "Straight up to the shaft, Vance—they're after us."

For there below, now, mighty masses of spheres were pouring up now from the gleaming surface of the spinning hidden world, were pouring up through the great opening through which we had smashed and out of all the great wells that yawned here and there across the surface of the world beneath us! It was the gigantic invasion of the flesh-things, surging up toward earth's surface at last! It was their great armada of conquest and out in the van of those swiftly-rising masses of spheres had leaped the great single black sphere of the rulers, and behind it leaped the swiftest of the spheres in pursuit of ourselves, all the countless masses of their globes pouring up still from the hidden world behind those foremost ones!

"They're overtaking us!" Kelsall exclaimed as he gazed tensely backward upon the rushing spheres beneath us. "They're coming closer!"

But already I had seen in a downward glance that that was so. For our own sphere, battered as it was by our wild crash upward through the swarming globes of the great hall, was not equal in speed to these unharmed spheres that were rushing up after us. And behind those foremost spheres, which were fully five hundred in number, there were rising swiftly also all the thousands upon thousands of other globes that had been waiting in their masses in the levels of the hidden world beneath!

Up—up—it seemed to me that my brain was reeling as we drove upward with a tremendous speed and those countless pursuers swiftly after us.

Now, though, the dark opening of the great shaft was coming into view above us, and now the great glow of the molten fires in which that opening yawned was beating fiercely upon our rushing sphere, I opened the refrigerating controls. As we came closer to the great surging currents of those slow-flowing molten masses, I heard from them an increasing roar of thunderous sound, the awful roar of the flowing sea of molten rock. Then suddenly there came a cry from Fenton, and as I glanced back for an instant at that cry I saw yellow rays stabbing up toward us from the pursuing five hundred spheres close beneath us!

Those rays fell short, though by little enough, for at yet the pursuing five hundred had not drawn within the effective range of their great rays. Swiftly, though, they were coming closer to us still, were overtaking us, racing upward toward that roaring molten sea that loomed above us! Flight and pursuit more strange than that there could never have been, the flight of our single sphere and its four human occupants, the titanic curving fiery ocean of the molten inner surface of earth's shell hanging above us with its single dark round opening; the five hundred foremost spheres of the flesh-things rushing up close after us; the great rectangular masses of countless spheres that were rising also, farther beneath; and the swiftly-spinning hidden world gleaming there beneath them, hanging and whirling there at earth's heart!

I felt the last cold grip of despair closing upon my heart in those instants as we rushed over the last few thousand feet toward that round opening. Before us now it was as though all the universe was dissolved into a single curtain of dazzling, molten fire suspended there above us, a giant flaming sea, the awful roaring of which came to my ears with stunning force in that moment. I knew, even in that instant, that Kelsall was right, that escape was impossible. The five hundred foremost spheres were close beneath us, now, and though they had ceased to loose their rays for the moment, hardly able to perceive us against that awful glare from the fiery ocean above, I knew that they were overhauling us still and that once in the darkness of the shaft's upper portions they would blast us from existence with their rays. Our last wild chance, our last chance to reach earth's surface once again, was gone.

So in that single moment despair gripped me, and with the passing of our last hope it was as though something had snapped within me. I gave utterance to a hoarse cry of defiance, gripped the control-wheels in my hands, and then as our sphere shot up into the shaft's great dark opening at last, that opening hardly to be glimpsed even in the molten sea that roared about it, I brought the sphere to a halt, swung it around so that it hung in that opening motionless! So that it hung just inside the shaft's opening, the flaming molten sea flowing and thundering all about it, facing the spheres that were rushing still upward toward us from beneath!

"No escape for us!" I cried. "Then no escape it

is—no warning for our world. But we'll not meet death fleeing up this shaft!"

"You're going to——" began Kelsall, but my mad shout cut him short.

"We're going to hold these spheres and flesh-things out of this shaft while we live! We're going to hold them back from the earth's surface!"

The Last Stand

THERE was a single stunned silence and then the shouts of Darrell, Kelsall and Fenton had joined my own. Our sphere was hanging there at the center of the great shaft's opening, poised there with all about us the thundering, roaring sea of molten rock, whose awful glare beat fiercely upon us, whose great heat was kept from us by the refrigerating controls! Five hundred feet in diameter was that opening, so that the part of the opening which must be guarded to prevent the sphere's from rushing upward was not large. Now as I crouched there at our sphere's controls, Kelsall and Fenton tense at the window, Darrell hunched over the ray-control, we saw that the five hundred foremost spheres beneath had glimpsed us halting there in the shaft's opening, and had themselves halted beneath us, the black sphere of their rulers at their head.

We could see their occupants peering upward, knew that against the awful glare from about us they could not more than gain a flashing glimpse of our own sphere, and then as we hung there amid the roaring molten fires of earth's inner shell, there seemed a great pause. Then suddenly at some swift order the five hundred spheres had shifted swiftly to a long column that was driving at full speed up toward the shaft and our sphere inside it!

Up—up——in an instant the spheres of that column's head were looming great beneath us, but then Darrell pressed swiftly upon the studs in his hands and down from our sphere they stabbed swift yellow shafts of deadly power, that clove down through the spheres of that uprushing column and with a great detonation had shot scores of them into nothingness! As they did so, as the rays of the uprushing ships had stabbed in answer toward ourselves, blindlessly and aimlessly, almost, I had sent the sphere leaping to one side of the shaft a little, and from that new position our rays were driving paths of instant annihilation down through their now-huddled, disorganized mass! Before that awful fire from an enemy whom they could scarcely glimpse, a third of their five hundred spheres annihilated in that moment by our down-leaping rays, they reeled back from us shattered from the awful blow that we had dealt them!

I heard the wild exultant cries of Kelsall and Fenton, saw that the black sphere of the flesh-thing rulers had driven to one side, that in the spheres beneath was a great confusion. A moment more and those great, far-stretching masses of spheres had been halted beneath, holding their formation there thousands of feet beneath us and the molten sea in whose single opening we hung. Then up from those spheres had rushed others to replace those we had destroyed, and as these and the survivors of the first attack formed again into a solid column, they were hanging for a moment out of range beneath us and then at full speed were leaping again up toward us!

Up came that column of rushing spheres like the first, its foremost spheres sending their yellow rays stabbing up even before they came within range of us. But again they were losing those rays blindly, dazzled as they were by the awful glare from about us, and the instant that they were within ray-range our own deadly beams were stabbing down again among them! And as there came to us over the awful roar of the fires about us the detonations of our striking rays, we could see scores upon scores of the uprushing spheres flashing into nothingness beneath those rays! Could see their column reeling aside as we thus stabbed down through it, other scores of its ships driving in that wild moment into the molten seas about our shaft and perishing there instatly in bursts of flame.

"We're holding them!" cried Darrell as that second shattered column reeled downward from us. They can't get at us here in the shaft!"

"And the world below—look!" shouted Kelsall. "Another great mass of its matter is breaking from it!"

For at that moment, with another great grinding, rending roar, a great mass of matter had shot out from the spinning world far beneath, a great section gouged suddenly to all seeming out of the gleaming levels of that world and hurtling out, hurtling out to strike with a giant concussion in the molten encircling shell not far from our great shaft's opening, making all the molten shell about us quiver with that great shock. It was another warning, that the doom of the hidden world was at hand within minutes, perhaps. And that sight, that doom that menaced now themselves, seemed to act like a great spur of fear upon the massed spheres beneath, that held all the flesh-things. For now as there flashed to them some unseen order from the rulers' black sphere hanging to one side, scores, hundreds, of those spheres had formed swiftly into another mighty column and again were rushing with suicidal fury up toward the opening in which we hung!

Thus, as they came up within ray-range of us again with their few foremost spheres' rays flashing upward, our own rays had driven down again among them, and stabbing down through the long solid mass cut instant and mighty lanes of annihilation through them! Still, though, heedless of the death before them, the remaining spheres of that column rushed up, hoping to catch us with one of their wildly-whirling rays, but ever as they came within range of us our deadly beams were annihilating them, our sphere leaping from side to side in the shaft to avoid their own, and then with but a scant score left of the hundreds of spheres of that third column, those survivors were reeling downward also!

For a third time our sphere had driven back their attack, had sent their shattered column reeling back down from the shaft they sought to enter, and now as we hung there amid the thundering fires Kelsall and Fenton and Darrell and I were shouting like mad beings, were crying out in all the wild excitement of battle that filled us! Beneath us we could see the giant square masses of the thousands of spheres hanging there still, out of range beneath the molten sea that hung above them, and could see a restless and panicky movement passing through them as their third attack was thus all but annihilated. Far to the right and left beneath us extended their masses.

Now as we gazed downward tensely we saw masses of those spheres rushing away to right and left *away* from beneath our opening, a movement that for the moment puzzled us. For as we gazed down we saw that there was rising toward us no swift succeeding attack, though the creatures beneath knew as well as we that but minutes remained before the final cataclysm of the spinning world beneath! Moments thus we hung tensely there, the great molten floods roaring still with never-ceasing power about us, all our sphere having grown so hot that almost its walls and controls seared our hands. Then suddenly there shot from either side just beneath those molten fires, just out of their zone of intenser heat, a double mass of spheres, driving thus suddenly into view from right and left just beneath the opening in which we hung and at the same instant letting their yellow beams of death drive through the great glare toward us!

"The spheres!" cried Kelsall in that instant. "They've come toward us just beneath the molten roof——!"

As they shot toward us it seemed that a wild storm of brilliant beams were criss-crossing across that opening in which we hung, but in the split-second that those beams had stabbed toward us, the control-wheels had spun beneath my hands and our sphere had leaped upward in the shaft a little in the instant before the deadly rays could reach us!

Then in the following moment, as the masses of spheres drove farther into the opening beneath us, our own sphere's rays were stabbing like light down among among them, leaping in brilliant destruction among them as they spun there in that mad moment! In a single flash, two-thirds of those spheres had winked into nothingness beneath our leaping rays, and in the next instant as the remaining spheres drove wildly into the opening and swerved from those rays they had ventured too close to the roaring molten walls of living fire about us and had seared and warped and burst and flamed in destruction. But straight up from beneath, and from either side still, spheres upon scores of spheres were whirling madly toward the opening of the shaft in which we hung!

Flash!—flash!—flash!—over the roaring from all about us there came the swift-succeeding detonations of our brilliant rays as they swept down in swift, dancing lanes of death through those masses of spheres that strove to break in upon us! Hanging as we were a little up inside the great shaft's opening, they could not loose their rays up upon us until they had burst up to that opening, from either side or beneath. And in the instant that they did so, as their masses of spheres appeared beneath us, their occupants blinded by the awful glare from about and above us, Darrell was sending out terrific beams lancing down in lightning-like stabs, sweeping through them in awful swathes of death, mowing them from existence as they appeared.

Clinging there to the sphere's controls in that mad moment, I sent it dancing from side to side in the great shaft, venturing almost to its death in its swift short rushes toward the flaming seas of death about us, leaping this way and that in the great shaft to escape the rays that the spheres rushing up from beneath loosed blindly up toward us! It seemed in that moment impossible, almost, that we four, that our single sphere, could thus hold back the countless thousands beneath. Yet our rays stabbed downward still, sweeping the opening just beneath us clean of the gleaming spheres as they rushed into it, while scores of others of those rushing spheres were whirling in that wild moment to dreadful death in the thundering fires around us!

Trapped

UP—up—and then came wild cheers again from Darrell and the rest of us as the uprushing swarms of spheres, recoiled from this death which we were loosing upon them! They drew back, seemed to mass swiftly their foremost globes into another great column like those first ones that had been hurled up against us, and then that column was rushing up from their far-flung masses of waiting spheres, toward us once more! But as it did so there came another distant, dull tremendous grinding roar from far beneath and as we glanced down we saw even in that moment another great section of matter, another vast mass, breaking loose from the spinning and deserted hidden world far beneath!

"Another warning—another warning of the hidden world's end!" I cried. "It's but minutes now till that end comes!"

"Hold steady!" Darrell shouted. "The flesh-things know it's the end for all of them if they don't get up in the shaft before their world bursts—they're coming up again!"

And at the very instant that the column had rushed up into ray-range of us one of its foremost spheres had veered to one side; and as our rays stabbed down and shattered the uprushing column, that single sphere had used that instant to rush blindly up into the glare of light and heat about us, rushing blindly up at immense speed and whirling up the shaft past us, on up into the great shaft above us!

In the next moment Darrell had sent a stab of yellow death up into the shaft after that uprushing sphere but before it could reach it that sphere had shot up and out of sight, rushing madly up the shaft above us!

"The hundred spheres at the shaft's top!" yelled Fenton suddenly. "It's gone up to get those hundred spheres—to bring them down upon us from above!"

Beneath us, the last of those attacking spheres had drawn down, down among all their far-flung waiting masses once more, hanging there with them for a moment as though waiting. Long minutes we waited, I knew, for the downrush of the hundred spheres above, to crush us, to annihilate us, between two simultaneous resistless rushes from above and beneath! There was a pause, a great pause of moments that seemed to our numbed senses hours, a pause broken by a sudden swift forming of hundreds of the countless spheres beneath into another column, a column that like the others was gathering there beneath us and then whirling up again toward us! And as it flashed up toward us there came a hoarse cry from Kelsall, gazing upward and as I glanced up I made out, high in the dimmer glow of the great shaft above us, little flashes of white light; little beams of white light that were growing each instant brighter, beams of light that came from a solid other column of spheres, of a hundred spheres, that was thundering down the shaft upon us from above!

Down from above, and upward from beneath, rushed those two columns, the one above the nearest, falling down upon us at nightmare speed. No

rays it flashed lest they stab down past us and destroy the column beneath, but it shot down upon us in a solid mass that meant to smash into instant annihilation by terrific impact! An instant more meant the end, I knew, and then as that solid, narrow column of spheres thundered down the great shaft's center down upon us, as the other column farther beneath rushed up, I had made a decision, had gripped the control-wheels in an iron grasp, and then after an instant's pause had sent our sphere rushing sidewise like light from the path of the down-thundering spheres above, had sent it whirling straight toward the molten, roaring flood of the great shaft's wall!

Then in an awful rending crash of metal upon metal those two columns of spheres, thundering up and down toward each other, had been changed instantly into a single great mass of wreckage that spun there in the great shaft's opening beneath us and that then was swirling into the great shaft's molten sides and vanishing in bursts of flame in them even as our own sphere leaped back to the shaft's center and away from those searing molten floods! Our swift leap sidewise had saved us from the downrushing hundred spheres from above. The next moment, as though spurred at last to mad, utterly heedless action by that spectacle, all the thousands of spheres that hung beneath us there were moving suddenly up toward us, up toward the shaft!

Up—up—in a giant mass of close-gathered spheres they were rising toward us, the black sphere of their rulers placing themselves now at their head! Purposefully, deliberately, more slowly, they were coming upward now, in their last great attack! And then as we awaited them, as my fingers gripped tensely the control-wheels, Darrell at the ray-control, Kelsall and Fenton at the window, there came suddenly from Darrell a hoarse, wild cry!

"The ray-control!" he cried. "It's useless—the sphere's ray-charges are exhausted!"

The sphere's ray-charges exhausted! Our only weapon gone, with the exhausting of those charges, which even as we had known needed to be recharged, replenished, at frequent intervals! It seemed to me that all things that we had gone through, all the things about us, the walls of molten fire that roared about us, the great masses of spheres that were rising deliberately toward us from beneath, the white faces of Kelsall and Darrell and Fenton that stared into my own, were whirling in an insane kaleidoscope about me in that moment. For with the exhausting of our rays, the passing of our only weapon, had come the end—the end for us and for the world of man above us!

Upward toward us, purposefully, grimly, those far-flung sphere-masses were coming, and now were almost within ray-range beneath us.

"But look! The world beneath—breaking up!"

Breaking up! For even at that moment as the masses of spheres had driven up grimly toward us, as their upmost spheres had come within ray-range of us, there had come from the hidden world spinning far beneath them a colossal thunderous roar of sound that drowned in its stupendous roll even the roar of the fires about us! And at the same moment we glimpsed the spinning, gleaming sphere of the hidden world there beneath, that had spun at earth's heart since earth's beginning, expanding, swelling, and then breaking into colossal masses of matter, that were whirling outward in all directions toward the molten floods of the earth's encircling shell!

There beneath us those massed thousands of spheres, holding within them all the flesh-thing hordes, hovered in that moment, as though stunned, stupefied, by the titanic cataclysm of their bursting world, and then, the next instant, as I saw those titanic masses of matter rushing upward toward us as they were rushing outward toward all the encircling molten shell of earth, I gripped the control-wheels and had sent our sphere flashing like lightning up the great shaft! And even as we leaped up thus we had glimpsed in that flashing instant the colossal fragments of the burst hidden world striking the massed spheres there beneath, annihilating those spheres and crashing with their wreckage toward the molten encircling shell!

Upward like a darting ray of light our sphere shot in that instant, up through the shaft at colossal, drunken speed, as about us there came a stupendous reeling shock—that shock that marked the cataclysmic death of the world within it! Then as I clung there to the controls in that mad minute there was a long, grinding roar about us, and the shaft's walls seemed to march inward upon our upward-flashing sphere, as beneath that terrific shock from within all earth swayed and quaked!

But as the shaft's walls moved slowly, grindingly toward us, as we flashed crazily up through the awful roaring darkness in that moment between them, I held open the speed-control with the last of my strength, heard as though from an infinite distance about me the hoarse cries of Darrell and Kelsall and Fenton, over the grinding, closing roar about us. And then abruptly, just as the great earth-mass about the shaft buckled about us, closed completely in about us, we had shot up into the open air! Had shot up into the darkness of night, with above us the brilliant stars of heaven! And as I halted out uprushing sphere, as we swayed there, gazing downward, we saw that there in the long triangular clearing the great opening of the shaft, with a final dull great roar, was vanishing, closing, even as earth quivered still about it!

The way to that vast space inside earth where had spun the hidden world was closed! Closed forever by the last titanic cataclysm in which that hidden world and all its spheres and all its great flesh-creature hordes had gone together to death!

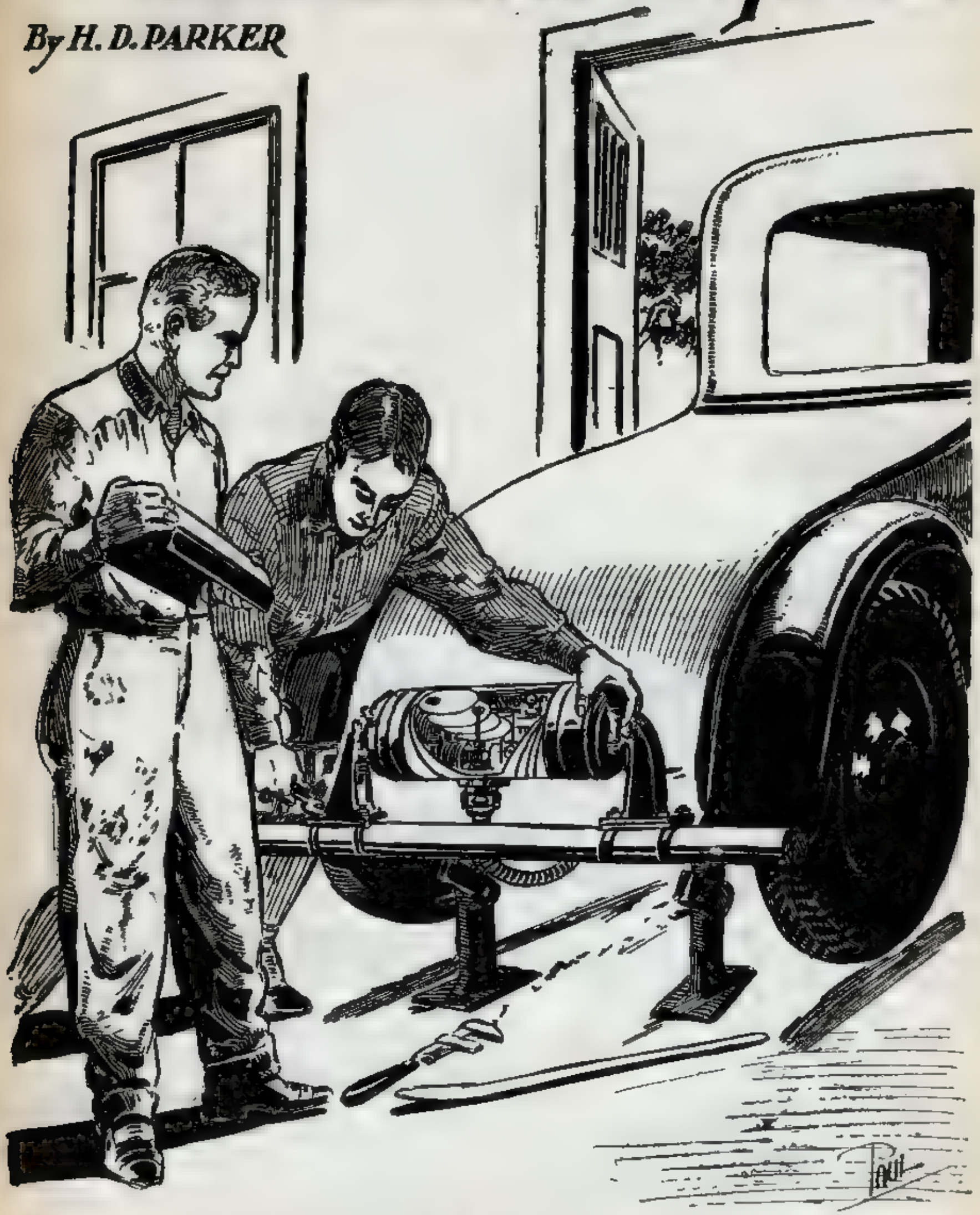
It was not until many minutes later that our sphere came at last down to earth's surface. In those minutes we had hung there, gazing downward as though stunned, gazing downward toward that great sunken circle of earth which alone remained in the clearing to mark the place of the great shaft. Then as I sent the sphere downward, as it came to rest, its humming ceasing, the door was clanging open and we stepped forth, Kelsall and Darrell and Fenton and myself, stumbling out onto the surface of the long clearing to stand there, gazing slowly about us.

Far above us stretched the great curtain of the brilliant tropical stars, and in the white light that fell from them all about us seemed unchanged, with the great shaft gone and the hundred spheres that

(*Continued on page* 135)

The Gravitational Deflector

By H. D. PARKER



Here he proudly exhibited what looked like a black Ducoed Presto-Lite gas cylinder, except that heavy brackets extended from each end at right angles to its axis.

"IT'S curious, Charlie, but did you ever wonder why we never trace to a final conclusion the little incidents of our daily lives? You know if we did we might be able, with foresight and inductive logic, to trace the developments to their ultimate effect. When you look back at any incident you can see obviously an inevitable chain of circumstances. You must wonder sometimes why the human brain refuses to project the outcome when the original events occur."

Many a monologue along this line have I heard from my friend, Tom Lee. Lee's ideas were always interesting; often they were startling. Yet his theory coincided with Poe's in that he believed that to an intelligence to whom was open all the complexity of the algebraic processes, the ultimate resolution of any problem was possible; was possible, that is to say, given the time necessary for the required computation.

And lacking the time for the necessary computation of the outcome of a trivial event, Tom was taken away from me, from his work, and in fact from the pleasant world in which we had been companions for so many years.

Looking back, I realize that I should have foreseen the eventful catastrophe. It is now so clear that no other result could have been expected from the attempted manipulation of titanic forces.

HARRY D. PARKER

STORIES of a fourth dimension are always of great interest to us. Mathematicians can prove today that there is such a thing as a fourth dimension. The trouble with most fourth dimension stories, however, is that it is difficult to follow them and that the author as a rule, presupposes that the reader is well-versed in the higher dimensions, which, as a rule, he is not.

The author of the present story has given us some excellent examples and illustrations, which makes it comparatively easy for us to follow his reasoning, and we believe, incidentally, that he has helped a great deal to make the fourth dimension better understood by the average layman. And while, for practical purposes, it may be many centuries before we can actually demonstrate the fourth dimension, yet whatever is done to enlarge our fund of knowledge along this direction should be welcomed by everyone interested in science.

The initial incident, and the remark thereby occasioned, which opened the tragic train of events, took place when Lee and I were motoring over the Mohawk Trail in New England. We were, at the time, running up one of the lesser hills soon after leaving the town of Charlemont. Traveling at a good rate of speed we rounded a turn to find ourselves right behind a monster truck, loaded with crushed rock. The truck had stopped to cool its motor, and, as is often the case with trucks, had chosen a position which made passing impossible.

"Tom," I said, after we had induced the driver out of the way, "It's a good thing we were going up hill or I could not have stopped without a smash."

"Now that's what I call a real interestin' remark, Charlie," Lee replied. "It opens up deucedly interesting lines of thought that have previously escaped me."

Lee is one of these slow spoken Yankees, a real New Englander, with a trick of slipping in an English slang word, or expression, when conversing. He is none of your quick spoken, incisive scientists, although his mind is lightning fast. (Odd how I still say "He is," for Thomas Lee is gone, and many a fellowship of scientists and delvers into the unknown mourns with me the loss of a man far ahead of his time in many ways, and a true friend.)

"Just what line of thoughts?" I asked.

"The possibilities suggested by your successfully stopping this car before it collided with the tail board of that truck," Lee replied.

Thus was the idea born. Like most new thoughts it was the result of a simple and natural incident of a sufficiently striking nature to force attention.

We said little as we sped along. I remained quiet, for I knew Lee's moods, and realized that he was deep in some line of thought. It was not until we had passed over the Hoosac Tunnel and drawn up to enjoy the view beside the great bronze Elk that looks forever over the mountain ranges that Lee began to give me a glimpse of what was in his mind.

"Now Charlie", he said, "One of the reasons that we get along so well together is that you are not a trained scientist. You have just enough scientific education to enable you to follow me, if I use reasonably simple expressions, instead of entering into technical argument with me."

"What then?" I asked.

"Simply this; you have a more than ordinary understanding of motor cars. In fact you are quite widely known as an automotive expert. That is the high hat way of saying that you are a little better than the high class factory inspector, tester, trouble shooter, designer, and internal combustion

engineer, combined in one person. And you and I my lad, are going to develop an absolutely new brake."

"Very good, only I don't see how come," I replied. "Dozens of good minds have gone to jelly trying the same thing, and I've no great desire to do likewise."

"We won't do likewise," said he. "Why do they fail? Because they try to go forward without any steps. They stick to friction, to converting power into heat, or to pumping, using up energy in compressing operations. They lack the vision to cut away from the old ideas. We will harness an entirely different form of power than has ever been used for braking."

"A new form of power?" I exclaimed. "What new power?"

"Not a new power, Charlie, a different power," Tom said. "Consider now—what two forces are everywhere available upon this earth?"

"Why," I said, "Let's see—there's heat, and electricity, and—"

"Wait a minute," Lee cut in. "I said are *everywhere* available. Also I said forces. Now heat and electricity are limited in many ways in many places on this globe. And too, I beg to point out that there is a jolly lot of difference between energy and force."

"I give up," I replied. "Don't ask me riddles, tell me what you have in your mind."

"It's like this," Tom answered. "Energy,—that is, to say, paralleling your classification which I interrupted, such as light rays, stray electric currents, solar heat, and so on are not comparable with the two *forces* that I have in mind. These are the force of gravity, and centrifugal force from the rotation of the earth."

"But," I said, "there should be no centrifugal force at a given moment at either true pole,—and you said everywhere present, Tom."

"A touch. A distinct touch, old bean," laughed Tom. "You are right. Centrifugal force is, at a given instant, absent at each true pole. However, since it's gravity that I have in mind, no harm is done to the idea, as yet. Now consider, Charlie, we have a force of known power, everywhere present on this world, which with the crude exceptions of counterweights, inclined planes, and percussion devices, is largely unused. Now suppose we find a way to apply this force to the braking of motor cars and other vehicles, what then?

"You will say, and properly, that this force tends to act along the lines of the earth's radii. But suppose we bend this force, as a light ray is bent by a mirror, or a prism. Having found our means for bending the lines of gravitational attraction, it can be regulated by varying the angle of bend, vertical being zero power, and horizontal being 100% effective. Do you follow me, Charlie?"

"Yes," I said. All we have to do is devise a way to bend it. How simple."

"Now don't be sarcastic, old chap," Tom replied. "The principle is the thing. If the theory is sound, it should not be too difficult to work out the details. Let's go on now. I'll think about it enroute and at Albany tonight I will do a little figuring."

The Plot Thickens

EARLY the following morning saw us enroute for Plattsburg. Beyond a few words at breakfast no reference had been made to the conversation of the day before. True, Lee had sat up half the night at his "figuring" but it was not until we were well on the way to Saratoga that he opened the subject.

"Charlie," Tom said suddenly, "I really worked hard last night and we have progressed. I have devised the method necessary for bending what I may call the lines of gravitational force. I have not worked out the mechanism necessary for doing this, as yet, but the method is fairly easy. All that is necessary is to interpose the fourth dimension. Or to state it in a different way, to pass the line of force through an area of the fourth dimension in which the bending control itself will be located."

"Of course," I replied, "I knew there was a catch in it. All we have to do is use the fourth dimension."

"Now do be serious, Charlie," Tom answered. "While the fourth dimension is not by any means fully explored, still we do know a lot more about it than the 'man in the street' realizes. As far as that goes, we know something about the next five additional dimensions, the ones that extend beyond the fourth, the E, F, G, H and I dimensions."

"Stop, Tom," I cried, "that's too much. I can't get this fourth dimension stuff clear, so for pity's sake don't addle me with some extra ones."

"Heaven knows I've tried to make the fourth dimension reasonably clear to you," Tom said. "I've talked cubicular extensions to you a dozen times. Try this tack for a change. It should help a lot in building up an image in your mind. Since you can't visualize it, I will now prove to you that you are, at this very moment, actually carrying in one of your pockets, not one but two beautiful examples of cross sections of fourth dimensional solids."

"That's too much; you can't do it, and you know you can't," I said. "And I'll just bet you one hundred good iron men, that you can't."

"I won't take your bet, Charlie," Tom replied. "It's not sporting to bet on a sure thing. But I'll show you. Let your mind trickle back to your school days. Consider the 'point' of your geometry lessons, as crudely represented by a dot. What is that dot but the cross section of a line? Now consider the 'line' in its turn. It is the cross section of a plane. A 'plane' is the cross section of a solid. That is to say the geometrical 'point' is the cross section of a one dimensional thing, a line, which has 'A' dimension only. The line is the cross section of a plane having two dimensions, 'A' and 'B.' The plane is the cross section of a solid having three dimensions, 'A', 'B', and 'C.' There-

fore the two little ivory dice in your lower right hand vest pocket, old thing, are true cross sections of a fourth dimensional, having 'A', 'B', 'C' and the difficult 'D' dimension."

"That's very neat," I said. "And I'm glad that I didn't have my bet taken up, but just how do you use the thing after it's tame?"

"For our needs, Charlie, we do this," was Lee's answer. "We know that the same basic laws apply to the A, B and C dimensionals, and we can therefore assume, until proved wrong, that they will apply and operate in the D dimension. We can therefore use the law of Harmonic Motion as a control for our angle variations. That, as you know, is to say that the velocity of a mass subjected to an initial impulse and free to move in space, whose resultant direction is changed, varies in proportion to the angle of such change in direction. You can follow that all right for it is a law which you recognize in gas engine design.

"Now we will effect our change in the direction of the force of gravity at a point in the D dimension, and will vary the angle of the change in direction to be proportionate to the velocity of the motor car."

"What you mean," I said, "If I understand you correctly, is, in simple English, that you will hitch the pull of gravity *behind* a car so that it will act in a horizontal direction opposite to the direction in which the car is traveling, and that, as the car slows up, you will change the angle of pull towards the vertical until, at the instant that the car stops, the force will be at its normal once more, following its usual 'up and down' path?"

"Exactly, Charlie," Lee agreed. "We will have a smooth stopping force that should bring a car to a standstill almost in an instant, from any speed, and, in addition, with absolutely no discomfort to the passengers, or disarrangement to the load, since there will be no forward momentum lag, as the contents of the vehicle will be acted on equally with the vehicle itself, by the bent pull of gravity."

"But," I asked, "If you can successfully bend the lines of gravitational attraction to stop a car by having the pull operate from behind, Tom, why can't you put one of the gadgets in front to pull the car, and so do away with the motor altogether?"

"Great Duke of Wellington," Lee ejaculated, "Charlie, my lad, you've hit it on the head. That's just another instance of two minds being better than one; especially when mine is the well known one-track brand and yours has the ability to wander all around an idea even though the idea is not always clearly understood.

"Already I can picture a light, graceful, vehicle, without the present day hood full of noisy, smelly machinery; free from the really crude mechanical devices for transmitting motor power to the rear axle, moving swiftly, quietly, safely over the highways. I say that knocks the idea of cars driven by motors, drawing their electric current from wireless power transmitters all flat. I know a chap who has been working for years to perfect a wireless power transmitter for just that use. Won't he turn a beautiful pea-green; my hat."

"That's all right as a conception of the future," I replied. "What bothers me is how can such a device be made?"

Lee seemed not to hear me. At any rate his next remark did not enlighten me further regarding the actual method of construction that he proposed to follow in the fabrication of his force controller.

"And we will not only bend from the up and down normal pull to horizontal, Charlie, it will be easy to make a 180° distortion of the lines of force by using two instruments. We will work them in pairs like return reflection mirrors.

"Then we *will* have done it. We will have accomplished the long sought for neutralization of gravity. A mass subjected to a properly controlled force of this nature will be without weight.

"You know, Charlie, there are a few mighty big scientific minds who hold that some method for nullifying weight was known to the Ancients. The stones of the so-called Temple of the Sun at Baalbek could hardly be lifted by any mechanism known today. The general idea in that direction has been the introduction of a screen, opaque to gravitation, under the mass in question. H. G. Wells calls this hypothetical screen substance 'Cavorite' if my memory is not at fault. We on the other hand will be able to operate our force from above, which has decided advantages.

"When we reach Plattsburg, as you know, I am going over to my place at St. Albans Bay. I shall at once get to work to develop our D dimensional director for the lines of gravitational force. On your way down from Montreal you were planning to visit me. If I am ready before you come, I will wire you at the Mount Royal and you can come ahead of your schedule. I can assure you that it will be well worth it."

Ready for the Test

NO doubt you, the reader of this record, have detected the error in premise which was to bring about the final astounding result. How it escaped Lee I cannot understand. Perhaps, at the time, he realized in which direction danger lay and planned later to construct a protection for it, which plan was later overlooked in his eagerness to get results.

I, myself, should have spotted it instantly, I think, had I not for many years fallen into the habit of letting Lee do my thinking for me, while we were together. That is a natural fault for one usually accepts the statements of an expert without delving very deeply into a subject on which the other is a recognized authority. Tom never seemed to be wrong, and I had long ago fallen into the easy method of assuming that he was therefore always right.

About two weeks after we had parted at Plattsburgh I was speeding across the lake in Lee's express cruiser, enroute to his summer workshop on St. Albans Bay, as a result of a wire telling me that

he was ready to make the first actual test of his device, and that he needed my assistance.

"What I want you to do first, Charlie," he said, "is to figure out the best place to attach the thing to an automobile. That is part of your end of this attempt to make another theory into a reality.

"I have succeeded in making the control; I have named it the gravitational deflector, which will bend the lines of force through the D dimension all right, and a neat little thing it is too. Also I jolly well added an automatic compensator, which acts like a governor, and tilts the primary deflector back in proportion as the car loses momentum. Thus the application of the force remains in constant proportion to velocity. There is also a secondary deflector which can be geared to operate with the primary. This we will use in our experiments in propulsion, and in the neutralization of weight."

"How does it work?" was my very natural question.

"Well, Charlie," Lee replied. "Don't forget that we do not yet actually know if it will work. I have not tested it in any way, keeping that until you could be present. My computations all indicate that it will operate exactly as we have planned.

"You remember our last conversation about the A, B, C and D dimensions? Yes? Well you will recall that a line is the cross section of a plane. Now to make a plane into a line all that is necessary is to pass the plane through the C dimension. That is to say, tilt the plane through its C dimension arc of travel until it is edgeways to your eyes,—foreshortening,—see?

"In the device that I have finished I use for each deflector a solid mounted on cubicular trunnions, which projections enable me to tilt the solid through its D dimension arc of travel. I am acting on the assumption reached by several minds that there is one of the laws known to the A, B, and C dimensions which does not act precisely in the same way in the D dimension, and that is the law of gravity. If this assumption is correct, the line of gravitational force can be reflected to a new direction from the fourth dimension.

"I think also that this solid could be arranged to become energized by motion. If so, when at rest it would have no power even though rotated entirely through the D space. This would be a better factor of safety, while operating for braking, than the tilting governor.

"There are, as I said, in reality, a pair of these deflectors, for what I want to do is to experiment with the development of our thoughts on forward motion and lifting. I have simply combined both instruments into one holder."

"How big is it, and what does it weigh?" I asked.

"The entire apparatus is in a cylindrical case," Tom replied. "It is 24 inches long, 10 inches in diameter, weighs five pounds three ounces, and must be mounted cross ways of the car, like a gasoline tank, on a plane that will give the best braking results. The point of location I am leaving to you, since I am sure that there is a 'best place' to set it, and while we are all used to the feel of a car whose resistance to forward motion is taking place at and below the axle line, I want you to determine what will be best when we cut loose from that conception of applying braking force."

At Tom's summer place we went directly to his combined workshop and laboratory, as we had lunched while crossing Lake Champlain. Here he proudly exhibited what looked much like a black Ducoed Presto-Lite gas cylinder, except, that from each end, very heavy brackets extended, at right angles to its axis, for attaching the device to the rear of an automobile. There was also a wire cable lead for connection with the conventional foot brake pedal by means of which the deflector was to be actuated. One side of the cylinder was conspicuously marked 'TOP'.

What Happened to Tom

TOM informed me that his computations showed that the device concentrated the lines of force from an area larger than the dimensions of the cylinder, depending on the height that the deflector was above the ground, and on the mass towards which the lines of force were bent, acting much as a lens gathers and concentrates light rays. Its power was therefore to a certain extent free from the limitations of mass. Lee was sure that it would stop a locomotive almost instantly at any speed, if the full force were applied by deflecting the attraction of gravity the full 90° from the vertical.

For this reason I decided that such a pull could only be applied with safety to one part of the car, that is to say to the chassis frame. Accordingly, in an hour, I drilled the channels and had bolted the brackets to them. I led the operating cable to the foot brake pedal and attached it. The pedals I disconnected from the regular brake drum mechanism, since, as I pointed out to Tom, if the force of gravity refused to perform, the hand brake would suffice to stop his light roadster. At last everything was ready for the first test.

I have always been thankful that Tom's assistant, Lynn Roe, was present at the trial of the gravitational deflector. I have read more than one account of the uncomfortable predicament in which the sole survivor of an experiment has found himself through lack of testimony corroborating his own.

Tom insisted on driving alone. I am sure that he did this, not because he feared any mischance, for he was too sure of his figures, but because he wanted to be the first human being to feel the force of gravity operating from behind him as well as from below.

"I will go around the drive," Lee said, as he stepped on the starter, indicating the sweeping circular drive before his summer house, "gradually accelerating until I pass where you are standing. I presume that I will then be traveling at about 40 miles an hour. Just after passing you I will come to that line," and Tom indicated a length of white

tennis court marking tape that he and Roe had placed across the drive. "At that point I will operate the D dimensional device which should bring the car to a stop, smoothly and instantaneously. If I skid, the lawn on both sides of the drive at that point is smooth, free from trees, and as there are no roadside ditches, no harm should result. You and Roe must stay exactly where you are. Here goes."

And he was off.

I presume that the drive was some three hundred yards around, but it seemed to me ages (and Roe has since told me that he had the same feeling) before Tom made the circuit. As he straightened out at the end of the curve and came back down the straight section of the road towards us, I would estimate that he was going at about 50 miles an hour. He was smiling as he passed us and rushed on to the tape line, at which he had indicated that he would apply the power of the new brake. He reached the spot—and was *gone!*

Yes, that's exactly what I do mean. Gone. For one instant the speeding roadster was rushing along the drive. The next split second it had vanished. Gone, gone completely; utterly. The small dust cloud which had swirled along behind Lee's car as he came down the road drifted slowly off over the velvet lawn; but the roadster and Lee had disappeared as completely as though they had dissolved.

We have not seen either Lee, or his car, since. No result has come from the international search for the missing man of science. Roe and I rushed to the spot where the car had last been visible. The tire marks showed clear (and without any indication of skid whatever) right up to the tape line, and then stopped.

Between the ends of the wheel marks the road was slightly hollowed as though some of the loose surface material had been removed with a rake. But that was absolutely all.

That is what I meant when I said that in retrospect one wonders why no thought was given to an outcome now so obvious to me, although I must admit that Roe does not agree with my conclusions.

His idea is that when Lee pressed down on the foot pedal thereby actuating his device that he, and the car, fell within what he terms a "shadow" area from the fourth dimension: that he actually entered the D dimension, car and all.

I do not agree, for still clearly I hear Tom's voice at the time that he propounded to me, "There are *two* forces." I am convinced that what actually occurred was this; when Lee tilted his infernal device he operated the desired deflection of the lines of gravity successfully, but that in so doing he neutralized the down pull in some way. Perhaps his secondary deflector became operative unintentionally. Perhaps the neutralization was the resultant of the angle of application of the distorted force lines. And the result from this, whatever the precise cause, was that Lee and his roadster shot from the surface of the earth at a tangent,—a living ball thrown into space, at a velocity of almost two and a half miles a second, by the titanic arm of centrifugal force.

THE END

The Hidden World

(*Continued from page* 129)

had guarded it gone also, to death far below. The long, triangular clearing, the two swift-flowing rivers on either side, the dark mass of the jungle stretching far away about us, our tent and boat there at the clearing's edge—all seemed the same as on that night, two days before, when we had waited there for the appearance of the fourth light-shaft, little dreaming what great horror lay behind the mystery we had come to solve.

Two days! It seemed incredible, as I stood there with Darrell and Fenton and Kelsall, that into that interval had been crowded all that we had seen and done. The appearance of the fourth light-column and the blasting upward of the great shaft; the uprush of spheres and flesh-creatures and their capture of Kelsall and Fenton; the hours of tortured waiting for Darrell and myself, and our mad venture down the shaft to the hidden world; our strange adventures in that stranger world and our rescue of our friends and flight up from it; our mad battle holding the shaft and that last great cataclysm that had annihilated the hidden world and all its creatures; these things seemed to me the events of years, rather than days or hours.

"Two days!" Darrell's low exclamation, beside me, was echoing my own thoughts. "And what we've been through in them—!"

Fenton was nodding. "Two days—and in them we've penetrated to another world, and have seen that world go to death."

"It all *was* real?" I cried. "We did go down the shaft—did find you two there in the hidden world?"

"It was real," said Kelsall, slowly, thoughtfully. "The horror that rose toward our world—the destiny that halted that horror at the last. Real—yes."

"And this sphere—real," Darrell said. "And the things that our world can learn from it, gain from it, when it knows at last from what it escaped—."

He was silent, and in that moment we all were silent, Darrell and Kelsall and Fenton and I standing there in the dim starlight at the clearing's center, with strange emotions clutching at our hearts. Standing there in a dark little group, with behind us the gleaming shape of the great sphere. Standing there, unspeaking and unmoving, as though unable yet to comprehend, to believe in, that miracle which had held back the doom that the creatures of the hidden world had prepared for the world of man, and which had loosed instead upon the hidden world itself and all its creatures a greater, swifter doom.

THE END

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The Reader Speaks

Due to the flood of letters on SCIENCE WONDER STORIES *from our readers we have been unable to print as many as we would wish in the regular monthly issues. We therefore take pleasure in printing herewith many letters that we want to call to the attention of our readers.*

In future issues of SCIENCE WONDER QUARTERLY, *however, only letters that refer to stories published in the* QUARTERLY *will be printed. All editorial communications regarding the* QUARTERLY *should be addressed to Editor,* SCIENCE WONDER QUARTERLY.

A New Method of Evaluation

Editor, Science Wonder Quarterly:

Although I am only twelve years old, I have taken a delight in reading the magazines you have published for almost the last four years.

This is my idea of SCIENCE WONDER STORIES:

Take every word that means excellent out of the largest dictionary in the world; multiply those words by the number of seconds in two thousand centuries, and add to that amount the number of stars in the heavens and the answer will give you a very slight idea of what I think of your magazine.

I have read the "Science Fiction Series" and think them great. I can assure any reader of "our" magazine that he is missing a rare treat if he does not send for them.

I am very pleased to see you are going to publish a Quarterly. I hope the stories in it are as good as the ones in the Monthly.

What is the matter with Edgar Rice Burroughs? He hasn't written for "our" magazine for several years.

"The Book Reviews," "The Reader Speaks," "Science News of the Month," "The Questionnaire," type of the stories and name of the book all meet with my approval.

And as for Paul's pictures. When better pictures are drawn Paul will draw them.

I think the idea of printing the authors' pictures is a fine idea as it allows us to become better acquainted with them.

Why was there no picture of Mr. Keller at the head of "The Human Termites" in the September issue?

Come on now readers, let's give SCIENCE WONDER STORIES a big yell. HIP, HIP, HIP, HURRAYYYYYY.

Forrest Ackerman,
San Francisco, Cal.

(The method of evaluating our magazines strains our mathematical capacities somewhat. We know that it means "good"; we leave it to one of our mathematical experts to give us the correct answers. Dr. Keller's picture will appear hereafter. Due to the special presentation of the first installment no room could be found for his picture.—*Editor*).

Pro and Con on Atheism

Editor, Science Wonder Quarterly:

Having now read four issues of your magazine SCIENCE WONDER STORIES I thought I would write to you.

Your last issue (September) is the best one, in my mind. The cover is best of all the ones on the magazines. Previously I have been against the lurid covers, but lately I have decided that after all, the cover only gives us a true idea of the makeup of the stories. If our friends are misled by interpreting the contents as trash, we must explain

(*Continued on page* 137)

CHEMISTRY

IF you are interested in chemistry you will be pleased to hear that a magazine written in plain English, containing a vast amount of information for the beginner and the more advanced student in chemistry is being published [illegible].

Chemical Experimenter

is a Monthly Magazine chock full of interesting departments, edited by men who know how to state worth-while facts.

There are departments about:

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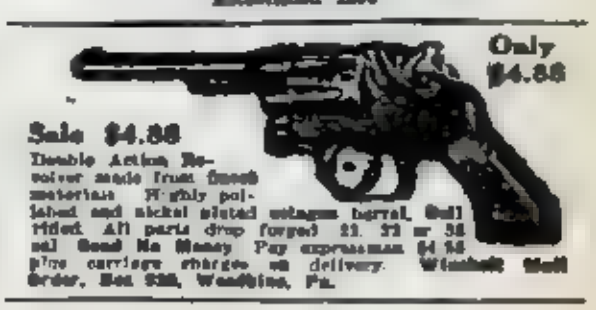

TO OUR READERS

Do not fail to read the advertisement on page 140 of this issue.

The Reader Speaks

(*Continued from page* 136)

that the stories and the aim of the magazine are otherwise.

By all means get more material like "The Cubic City." Many readers would readily contradict my statement that "The Cubic City" is the best story since some of the same type were printed in your first magazine (of science fiction) back in 1927.

Maybe no one else can understand what I mean by that "type," but stories like "The Star of Dead Love," by Gray; "The Machine Man of Ardathia," by Flagg; "The Fourth Dimension Roller Press," by Bob Olsen, etc., are of that type.

Somehow or another they take your mind from the uncanny thoughts of eternity, the indefinite extension of the universe, etc. The morbid thoughts are brought up by stories like "The Talking Brain," by Hasta; "The Telepathic Pickup," by Sargent; "The Plattner Story," by Wells, and numerous others. They all leave an everlasting fear in me, although such stories as ghost stories do not affect me at all.

If religion must come up I will add a bit. (Religion sure brought some hot arguments in the Science Correspondence Club.) I think that religion, ethics, etc., will be taken over by science in the future the same as philosophy and sociology have been.

L. E. Foltz, of my native state, in SCIENCE WONDER STORIES, page 378, says that an infidel either was one before reading science, or else was unobservant. I was *not* an atheist before reading science fiction (first in your magazine in 1927), and I don't think I am unobservant.

In the first place, the only reason that men have ever believed in a God and so on, is that their superstitious answer to the question of "Where did our universe come from?" (asked because of their instinctive want to know why, how, and what) attributed it to a higher up, and because no one can "disprove" the existence of a God, only by reason, which does not have to be true.

You may say to a believer, "How did God get here?"

They will say, "He never was created. He always has been here."

Just the same way, why not say that nature, matter, and energy, light, electricity, etc., which are all equivalent to matter, have always been here, and not go around the stump by saying that a Spirit has always been here, and that he made matter?

Let me ask all of you who argue against the atheists this:

If a babe, was raised up, isolated from our present religious ideas in every way, and then taught evolution, astrophysics, astronomy, physics, etc., and then taught all matter has always been here (of course, at times in form of energy, light, and electricity), would this individual ever be anything but an atheist? Now answer truly. He would not believe in eternal life in spirit form, because science teaches that without a brain there is no thought. And no science even considers this foolish, metaphysical stuff about spirits, or souls. So much for this.

Instead of running two halves of two different serials, couldn't you publish one complete long story in each issue, still making 96 pages?

Or, do serials really help get subscribers who want to read "the rest of their story"?

(*Continued on page* 138)

A Helpful Suggestion to

DIRECT SALESMEN

who want to make more money

-AND BUILD A PROFITABLE YEAR 'ROUND BUSINESS

THIS is a conservative advertisement. I want to talk to men who want a line they can stick to year in and year out—men who want to keep their earnings at a high level all the year around.

I am not looking for fly-by-night "once-over" experts, I want SALESMEN, who want to sell the best shirts on the market and enhance their reputation for fine goods.

Bostonian shirts sell at the extremely low price—$9.00 value—three for $6.95 postage paid with a commission of $1.50 for you on each order of three shirts.

These shirts are made of the finest quality of New England Broadcloth, full and roomy at every point, and carefully sewn with the strongest thread. Bostonian shirts are tailored by experts—the collars, neckbands, sleeves and cuffs fit perfectly, and the buttons stay on.

82% of the men in your town are wearing broadcloth shirts at this minute, and you can give them a full range of guaranteed fast colors to select from—White, Tan, Blue, and Grey—in both collar attached and neckband styles, in practically any neck size, and sleeve length from 30 to 36. We invite comparisons between our shirts and any other Broadcloth shirt on the market.

When you take on a new line your reputation with your customer is at stake. You cannot afford to give them anything but the best. For sixty-five years the Bostonian Manufacturing Co. has been making quality shirts and is always ready to back up any of its merchandise with an unconditional Money Back Guarantee.

You can be sure that your customers will get just what they order at all times. We guarantee twenty-four hour shipment by prepaid Parcel Post to any part of the United States. We insist that both you and your customers be pleased. Our men stay with us because they know they can depend upon getting a square deal at all times.

Not only can you sell Bostonian shirts in quantities all year around, but you can sell them right along with any other line you are carrying and get two commissions where you are now getting one.

If you are anxious, as I assume you are to handle the best and keep your income at the peak all year around, tell me you are and I will have your Free Fall and Winter outfit mailed to you immediately.

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Do you want extra money for yourself? Perhaps your husband can't give you everything you want. There are always bills to be paid—things to be bought. Extra money comes in mighty handy. You can easily earn it!

Give me a few hours of your spare time, or if you can, your full time. I'll pay you well. I'll establish you in a refined, profitable business that will constantly pour dollars into your purse.

Women "go wild" over our smart new line of DRESS GOODS, SILKS, and WASH FABRICS. The low prices and high quality of our line for making clothes, draperies and house furnishings assure amazingly easy sales—enormous repeat trade.

You only have to show the line. Women are delighted. They order immediately. They recommend you to their friends. Your business grows rapidly. You become known among your customers as fashion adviser. They come to you for their materials and for genuine Ladies Home Journal Patterns. You make plenty of money. Thousands of others are doing it—you can too!

Experience Unnecessary—I Start You And Pay You Well For Your Odd Hours

You don't need any experience or money. I'll start you—show you how to sell—show you the methods my other representatives use which bring them $25 to $75 every week. You'll certainly make that much. Maybe you'll make more! I'll co-operate with and help you. I'll make everything easy for you!

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The Reader Speaks

(*Continued from page 137*)

In closing I might add that the September issue of SCIENCE WONDER STORIES is the *only* science fiction issue that ever contained *all* non-dry, and A1 stories. See if you get any kicks on them. I'll bet you don't, unless the kicks are concerning some idea in one of the stories which is a scientific impossibility.

Irville Woodward,
Newcastle, Ind.

(We are glad to note this reader's appreciation of "The Cubic City". Louis Tucker is a delightful writer and loves to poke fun at our mechanical civilization. He is just as necessary to us, to restore and balance our point of view, as those who seriously want to push us forward along our present road and those who want to hold us back. Ridicule has, in history, provoked as many changes as the most serious and logically complete criticisms. We leave the discussion on atheism for our readers to fight out.—*Editor*).

On the Silver Sea

Editor, Science Wonder Quarterly:

I want to compliment you on your new magazine, SCIENCE WONDER STORIES. You have certainly started off with a fine assortment of stories. I am particularly interested in Captain Noordung's "Problems of Space Flying" and I am glad to read that he is to continue with his articles.

As regards the suggested department of Scientific Technical questions, I am heartily in favor of it and I believe I can make use of it.

I found Jack Williamson's "Alien Intelligence" to be about the most interesting story in your first two issues. I still don't understand just what the liquid in the "Silver Lake" was supposed to be. I wish the author hadn't allowed his hero to run out of "gas" in getting back to earth. The excitement he could have caused with the machine as well as determining the components of the "silver liquid" would have made an interesting sequel.

"The Moon Beasts," by William P. Locke, offers an excellent chance for a sequel. Do you think Mr. Locke will write one? It is an interesting story and brings up the old possibility, which has been much discussed, of life on the moon.

Dr. David H. Keller's stories are always extremely interesting and human and there is always a moral behind each one. I hope he succeeds in his apparent purpose. Will we have some more of his "Taine the Detective" stories?

Mr. Repp's "Radium Pool" promises to be an interesting story. He is an interesting writer.

Before closing I want to mention that I have also read the first editions of AMAZING WONDER STORIES and find it a fitting sister magazine to SCIENCE WONDER STORIES. Victor MacClure's "Ark of the Covenant" is the best story there. I get more helpful information from your "Science News" department and "Aviation News" department than any other place. School isn't in session now but I find good use for this information while it is.

Wayne McAdam,
Pasadena, Cal.

(On Page 240 of the August issue of SCIENCE WONDER STORIES the scientist Austen says in the "Alien Intelligence," "You know that lightning in the air causes a union of nitrogen and oxygen to form nitrous and nitric acids which may

(*Continued on page 139*)

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The Reader Speaks

(*Continued from page 138*)

later release their energy in the explosion of gunpowder and nitroglycerine. In much the same way the force that forms the silver fluid utilizes the photochemical effect of sunlight to build up a complex molecule containing oxygen, nitrogen and the inert gases of the helium group. It is very unstable and may be disrupted with great release of energy". We believe this answers Mr. McAdam's question.

We have asked Mr. Locke for a sequel to the "Moon Beasts" and have hopes of getting one soon.—*Editor*).

No More Commonplace Than Archimedes!

Editor, Science Wonder Quarterly:

Having never written you as to my views on SCIENCE WONDER STORIES, I crave to say a word or two about our "pet."

I am very much pleased with the cover designs by Artist Paul, especially the August issue. As to the design in the July issue, I think it was perfectly proper. That editorial was no more commonplace than Archimedes' idea to lift the earth. I'll wager if someone would write a story about that no one would throw brickbats at Paul's design.

Please stop publishing H. G. Wells—his "Diamond Maker" was an insult to our "Pet." "The Reign of the Ray" was simply terrible. Please scratch those two writers off your payroll. "The Eternal Man" had more room for improvement than any other one. "Science News of the Month" don't go over with me—a pure waste of space. You should use this space for more letters from readers. I enjoy them as much as I do the stories.

Am very sorry to hear of the death of Mr. Garrett P. Serviss as he was one of my favorite authors. Indeed, he was the best science fiction writer of his time. Please reprint some of his stories, especially "The Conquest of Mars" and "A Columbus of Space."

Why not some stories by Edgar Rice Burroughs? He's a master of unusual science fiction.

Please do not change the form of your magazine in any way, although the paper of the second issue is far superior to that of the first. Leave it as it is. The size is exactly right. I am binding my issues in volumes of three and it makes them of just the right size. If you change now my forthcoming library of SCIENCE WONDER STORIES will go "flooey."

More stories by James P. Marshall and Ed. Earl Repp, please, and you might top this off with a few by Ray Cummings.

"Dave" Hedrick,
Fincastle, Va.

(The criticism against the July issue was not addressed, we believe, to the editorial but to the cover. It was the cover that was deemed commonplace. And as we wrote in reply to the criticism, "commonplace" is the last thing we want any of our material to be. However, we are glad to see that that opinion was not shared generally by our readers. We appreciate nevertheless the frank opinions expressed on any part of our magazines. The reprint question, we wish Mr. Hedrick to know, is now under consideration. We are slowly accumulating the feelings of our readers and before long we shall surprise you with something.—*Editor*).

(*Continued on page 141*)

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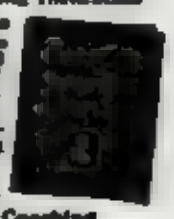

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The Reader Speaks

(*Continued from page* 139)

Attention, Astronomy Lovers!

Editor, Science Wonder Quarterly:

In a letter you received from Joseph Fox he mentioned his love for Astronomy. Why doesn't he send to Mr. Leon Campbell of Harvard College Observatory, Boston, Mass., and ask to join the American Association of Variable Star Observers. They give out monthly notices to the members and every year at the annual meeting you have a chance of meeting some of the world's greatest astronomers.

C. E. Furness' book "An Introduction to the Study of Variable Stars," would be a good book for a beginner in the variable line. I have already decided to become an astronomer. Why doesn't Mr. Fox write to me? I am younger than he, being only fourteen.

I have no criticism against the magazine; it has no faults.

Donald McGlenn,
Chicago, Ill.

(We are addressing this prominently to the attention of all astronomy lovers. Astronomy is a fascinating science and young Mr. McGlenn is to be congratulated on choosing it so early.—*Editor.*)

Wants Science Club

Editor, Science Wonder Quarterly:

I have been a constant reader of different scientific publications issued by you during the last three years, and during this time I have noticed that many readers have expressed their desire to see a scientific club of some sort formed.

I, for one, would like to hear a few suggestions from those interested, and perhaps we could organize a club that would not only serve to increase public interest in science, but would also turn out to be a real educating and interesting organization to all amateur scientists, and others interested in the scientific future of the earth.

My suggestion is that you, Mr. Editor, form such a club for the benefit of the readers of your wonderful publications, and also add a couple of pages to all future issues of SCIENCE WONDER STORIES, devoting the space to the use of the members of the club, through which they could exchange suggestions, tell of their experiments along different scientific lines and put before the other members and readers their pet scientific problems.

I am sure that once this subject is brought up in "The Reader Speaks" columns, we will find many suggestions will be offered.

Edward E. Chappelow,
Chicago, Ill.

(This letter is from one of our most promising writers, the author of "The Planet's Air Master," in AIR WONDER STORIES, and "In Two Worlds," published in SCIENCE WONDER STORIES.

What Mr. Chappelow suggests is an inspirational idea. We have been considering the Science Club problem for some time. As Mr. Chappelow is no doubt aware, there exists at present the Science Correspondence Club, which includes many of the features he would wish to incorporate.

What we would wish to have is a real expression of opinion from our readers on the question, "Do they want it?" If so they should certainly have it.—*Editor*).

(*Continued on page* 142)

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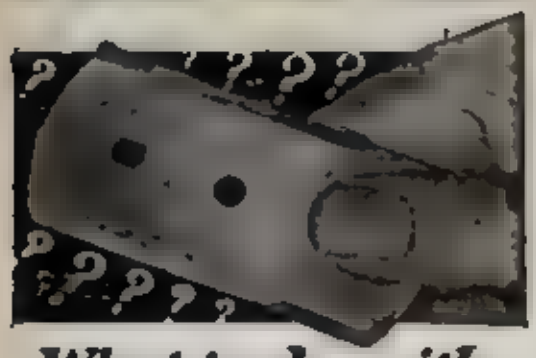

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The Reader Speaks

(*Continued from page* 141)

He Wants Reprints

Editor, Science Wonder Quarterly:

I was somewhat disappointed in the first four issues of SCIENCE WONDER STORIES. It isn't the paper. The paper is fair. The illustrations were all right, although a few more would be appreciated. Really, there is nothing the matter with them except for one thing. None had a single reprint. In AIR WONDER STORIES we are getting "The Ark of the Covenant" and I hope to see "The War In the Air," by H. G. Wells, forthcoming presently. Won't you please give us more and more reprints? Here are several that are wanted badly: "Tarrano the Conqueror," "The Man on the Meteor," "The Fire People," "The Girl In the Golden Atom," and the short stories having "Tubby" as their hero (?). These stories, as you know, are all by Cummings. We all like him, so please print several of his tales.

"The Blind Spot," by Homer Eon Flint and Austin Hall! What a story! Please print it.

I have not read "The Mastodon Milk Man," by Savage, but have heard about it and I am positive that we (the readers) would enjoy it immensely.

And now, my dear editor, I know that you would like to make us happy, so please give us from the old bunch of originals, several new stories (for a while) and give us reprints.

So many of our readers are skeptics. Why not make a new "Believe It or Not?" One page, or even a half page, would be plenty. Many are kicking about the space given over to the "Forum," "The Problems of Space Flying," Questionnaire and Readers' Letters. But who would object to a second "Believe It or Not?"

Hoping that SCIENCE WONDER, AIR WONDER, and RADIO-CRAFT will be successes, I remain,

Isidor Manyon,
Jersey City, N. J.

(Altho Mr. Manyon's suggestion about a new column is appreciated, we must decline the use of it at present. We have already a number of extra features in our magazines, the number of which could be extended almost indefinitely. The question of reprints is one that is being considered and we promise our readers some interesting news on it in the near future.—*Editor*).

A Longer Walk in "The Cubic City"

Editor, Science Wonder Quarterly:

I would like to offer a little criticism on Louis Tucker's story "The Cubic City," wherein he states that in a cubic city two miles in height, width, and length, no point is farther than two miles from any other point. I wish to contradict this as the distance from a point at any corner on the top floor to the corner directly below on the main floor is two miles, and from the same starting point to any other point on the main floor is greater than two miles. If travel is made only in vertical and horizontal directions and not diagonally, then the greatest distance would be six miles. This would be the distance from any corner of the city to any corner directly opposite and on a line diagonally through the exact center of the city. Nevertheless I enjoyed the story very much.

I don't think you'll find anything but praise for the "Human Termites" if the next installment is equal to the first, and I'm sure it will be. It was so real and serious in its nature that I had to stop several times and smile at myself for almost believing that the story was true in its entirety.

I would enjoy reading a sequel to "The Radium Pool." I think Mr. Repp has better material for a sequel than the "Radium Pool" itself.

J. Orville Buser,
Bradley, Ill.

(Louis Tucker did make a slight inaccuracy when he stated that no part was more than two miles from any other. Going along the edges of the cube it is possible for a person to travel six miles from one extreme point to another. However, we believe that the conditions of travel even for the extreme distance would be much more enjoyable than the present mode of transportation that characterizes our large cities.—*Editor*).

McDowd's Defense Not Necessary

Editor, Science Wonder Quarterly:

I have just been reading Mr. McDowd's defense of "The Marble Virgin." I wish to make it clear to you that it was not needed as far as I am concerned. I think it was a good story, full of science, and I certainly want Mr. McDowd to write a sequel.

P. Wicks,
Telkwa, B. C., Canada.

(We print this letter to give our readers the other side of the "Marble Virgin" controversy. Mr. Wicks speaks for a great number of readers.—*Editor.*)

It Shall Never Be Again

Editor, Science Wonder Quarterly:

This letter is a brickbat, and with this warning I hope that you will not throw it aside without reading further. For I subscribed for your magazine as soon as I received your letter several months ago, and feel justified in making a complaint. Although I have noticed the same thing I am complaining about several times before, I am just beginning to wonder if the stories you publish are really edited.

All this leads up to my subject—Low-brow English! Mr. Gernsback, a man of your editing experience should know the correct use of "I" and "me".

The story that aroused my ire was "The Radium Pool," by Ed Earl Repp. On several occasions Repp has used the words "carried Sands and I". The mistake is quite obvious to any student of English. Of course the author should know his grammar before he submits a manuscript, but the proof reader should not be so much asleep as to let a glaring mistake like this past him.

After so egotistically telling you how to run your magazine, let me say that otherwise I enjoy the stories immensely.

Bob Emmett,
San Francisco, Cal.

(The editors acknowledge that such an error occurred in "The Radium Pool." Under ordinary circumstances we would bow our heads and say "It Shall Never Be Again." But in this case there is a reason. All that the author, editor and proofreader were trying to do was to convey the local color to the speech of the miner. If he had said "Sands and me," it would have been too grammatical for a "desert rat."—*Editor.*)

(*Continued on page* 143)

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The Reader Speaks

(*Continued from page 142*)

An Objector Converted

Editor, Science Wonder Quarterly:

I'll make my complaints first and throw flowers afterwards.

I noticed in the September issue that you are binding the magazine with just one wire staple. By doing this the magazine is harder to handle. Please go back to the two staple binding.

I will not mind the "Science Questions and Answers" department if you do not make it any longer than the one in AIR WONDER STORIES. I noticed that "Aviation News" is shorter than "Science News of the Month." It, of course, does not take up so much room and leaves more space for fiction. Besides having more pages for fiction, AIR WONDER STORIES has more on each page than SCIENCE WONDER STORIES. Why aren't the two magazines alike? I would like to see SCIENCE WONDER STORIES like AIR WONDER STORIES.

I was quite undecided on the best story in the September issue of SCIENCE WONDER STORIES, but I finally picked "The Onslaught from Venus," by Frank Phillips; "The Radium Pool," by Ed Earl Repp took second place and the first part of "The Human Termites," by David H. Keller, M.D., third place. I hope to see more stories like "The Cubic city." How about an interplanetary serial? Why not put out an interplanetary stories magazine?

I hope to see a sequel to "The Radium Pool." It certainly deserves one.

I like the idea of starting a new serial in the same issue that the old one ends in. Keep it up.

Jack Darrow,
Chicago, Ill.

(We are very glad to note the conclusion of Mr. Darrow, who formerly objected to the inclusion of the "Questions and Answers" and the "Science News." We are sure that he will come to enjoy them as do most of our readers.—*Editor.*)

The Effect of the "Human Termites"

Editor, Science Wonder Quarterly:

I congratulate you on your wonderful magazine, SCIENCE WONDER STORIES and its sister magazine, AIR WONDER STORIES, of which I have read several copies. Your September issue had several good stories in it. I list them in order to my preference:

"The Human Termites."
"The Onslaught From Venus."
"The Radium Pool."
"The Problems of Space Flying."
"The Cubic City."

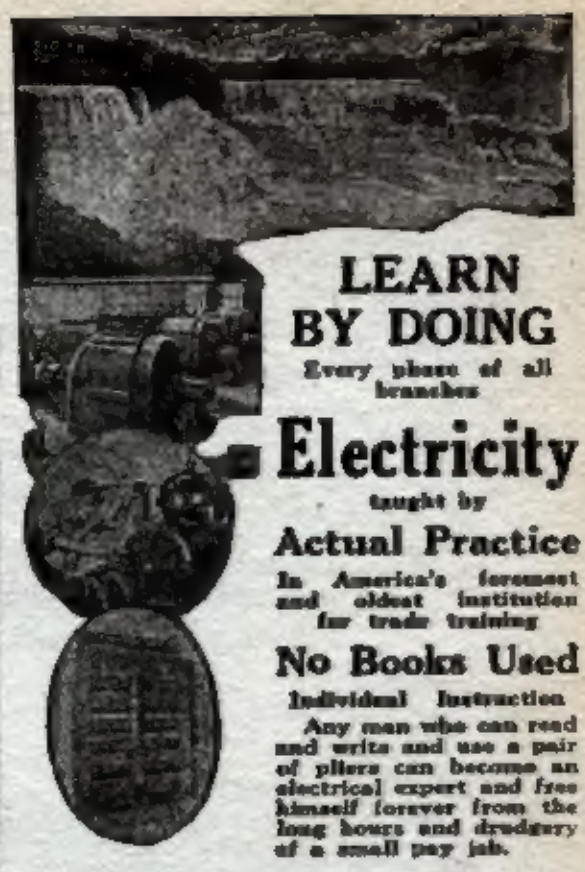
"The Human Termites" is great, and gives you some thought. That story got my goat. I went to bed expecting my bed-covers to be eaten up.

All the stories were good except "The Cubic City." It was too funny for a SCIENCE WONDER story. I just couldn't get it.

Like many other readers, more interplanetary stories. Have Edgar Rice Burroughs write some stories.

Henry Stoschus,
Easton, Pa.

(We are truly sorry that the effect of the "Human Termites" was so pronounced. However, if a good many of those who should be roused to combatting the insect menace could read "The Human Termites" and feel as Mr. Stoschus did, the menace could be conquered once for all. So Dr. Keller's work has a great educational value as well as a tremendous imaginative appeal.—*Editor.*)



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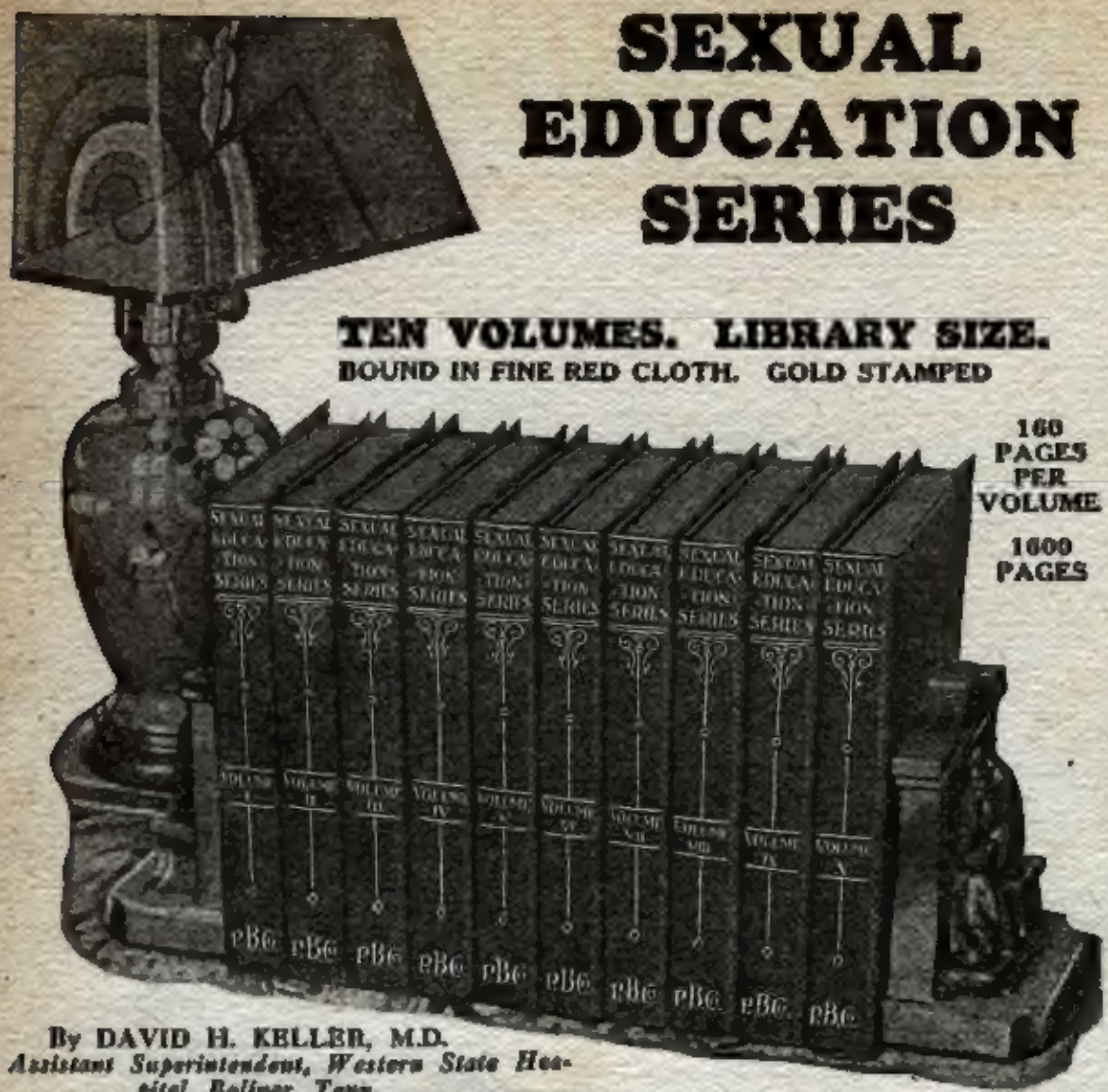

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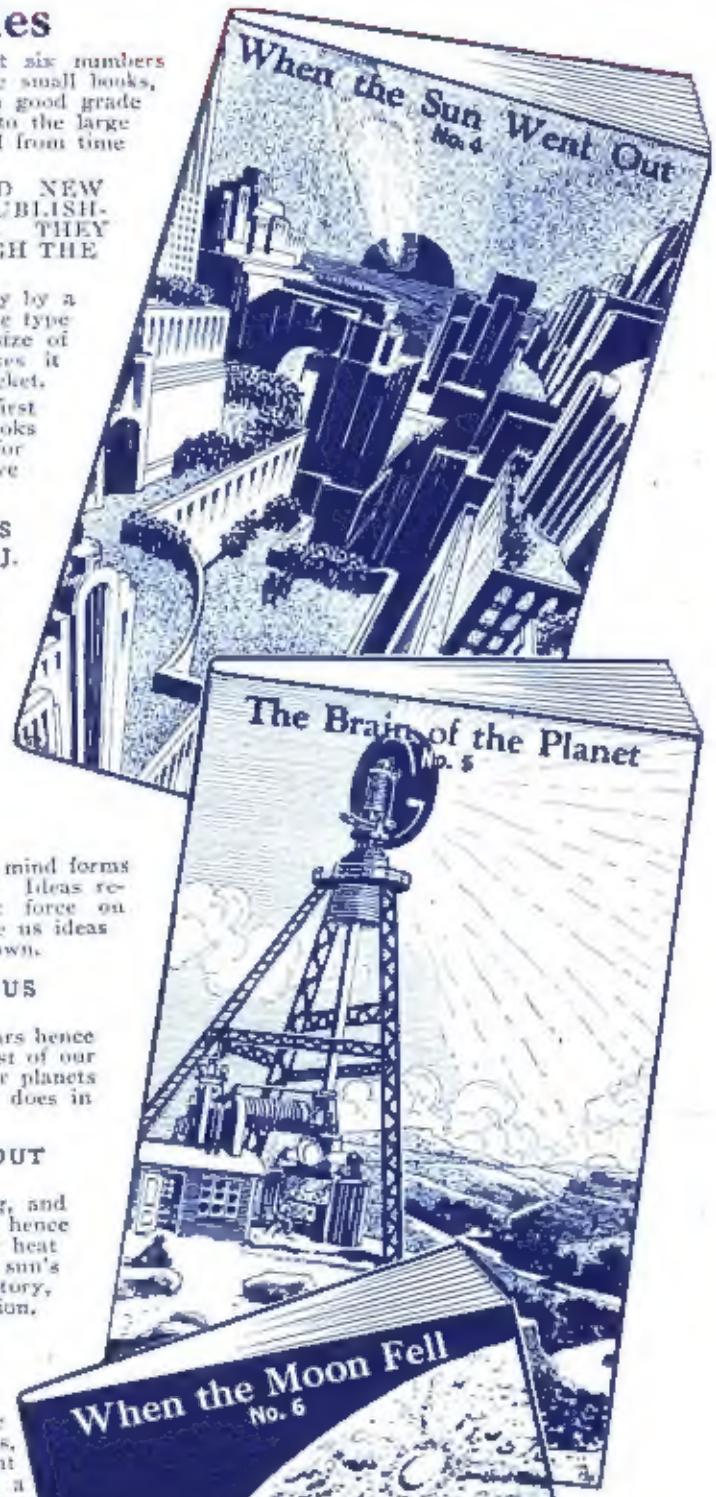

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